Oracle8™

Installation Guide for Sun SPARC Solaris 2.x

Release 8.0.6

June 1999

Part No. A70109-01

Topics Including:
Requirements and Features
Setting the Environment
Installation Tasks
Configuring the Oracle8 System
Upgrading and Migrating
Using the Oracle Installer
Basic UNIX for Installing Oracle8
National Language Support

ORACLE

Oracle8 Installation Guide for Sun SPARC Solaris 2.x

Release 8.0.6

Part No. A70109-01

Authors: Donn Fisher, with Kevin Adams and Louis Dobrozensky.

Contents

4 Configuring the Oracle8 System

5 Upgrading and Migrating

A Using the Oracle Installer

Send Us Your Comments

Oracle8 Installation Guide for Sun SPARC Solaris 2.x

Release 8.0.6

Part No. A70109-01

Oracle Corporation welcomes your comments and suggestions on the quality and usefulness of this publication. Your input is an important part of the information used for revision.

- Did you find any errors?
- Is the information clearly presented?
- Do you need more information? If so, where?
- Are the examples correct? Do you need more examples?
- What features did you like most about this manual?

If you find any errors or have other suggestions for improvement, please indicate the book title, part number, chapter, and section. You can send comments to:

Technical Documentation Manager
Platform Technologies Division
500 Oracle Parkway, Mailstop 1op2
Redwood Shores, CA 94065
USA

If you would like a reply, please give your name, postal or email address, and telephone number.

If you have problems with the software, please contact your local Oracle Support Services Center.

Preface

Purpose

This guide provides instructions to install and configure the Oracle8 Server on Sun SPARC Solaris 2.x. This guide supplements information found in the Oracle8 and Oracle8 Enterprise Edition documentation set.

Audience

This document is intended for anyone responsible for creating a basic Oracle8 Server installation on a Sun SPARC Solaris 2.x system.

Oracle8 and Oracle8 Enterprise Edition

Unless noted otherwise, features and functionality described in this document are common to both Oracle8 and Oracle8 Enterprise Edition.

Typographic Conventions

`monospace`	Monospace type indicates UNIX commands, directory names, pathnames, and filenames.
brackets [ ]	Words enclosed in brackets indicate key names (for example, Press [Return]). Note that brackets have a different meaning when used in command syntax.
italics	Italic type indicates a variable, including variable portions of filenames, or emphasis.
UPPERCASE	Uppercase letters indicate Structured Query Language (SQL) commands, initialization parameters, or environment variables.

Because UNIX is case-sensitive, conventions in this document may differ from those used in Oracle product documentation.

Command Syntax

Command syntax appears in `monospace` font. The following conventions apply to command syntax:

backslash \	A backslash indicates a command that is too long to fit on a single line. Enter the line as printed (with a backslash) or enter it as a single line without a backslash:
	`dd if=/dev/rdsk/c0t1d0s6 of=/dev/rst0 bs=10b \`
	`count=10000`

braces { }	Braces indicate required items: `.DEFINE {macro1}`
brackets [ ]	Brackets indicate optional items: `cvtcrt` *`termname`* `[`*`outfile`*`]` Note that brackets have a different meaning when used in regular text.
ellipses ...	Ellipses indicate an arbitrary number of similar items: `CHKVAL fieldname` *`value1 value2 ... valueN`*
italics	Italic type indicates a variable. Substitute a value for the variable: *`library_name`*
vertical line |	A vertical line indicates a choice within braces or brackets: `SIZE` *`filesize [K|M]`*

Contacting Customer Support

Please copy this page and distribute it within your organization as necessary.

Oracle Support Services (OSS) can be reached at the following numbers (the hours are specified in your support contract):

- In the United States, call: **1.650.506.1500.**
- In Europe, call: **+44.1344.860160.**
- In Asia, call: **+81.3.5717.1860.**

Please prepare the following information before you call:

- ❑ Your CSI number (if applicable) or complete contact details, including any special project information.
- ❑ The release levels of the Oracle Server and associated products (for example, Oracle8 Server release 8.0.5, and Oracle Forms release 4.5.6.3.2).
- ❑ Operating system name and release level, including patches and packages.
- ❑ Details of error codes, numbers, and descriptions associated with the problem.
- ❑ A full description of the issue, including:
  - What happened? For example, the command used and result obtained.
  - When did it happen? For example, time of day, or after a particular command, or after an operating system or Oracle upgrade.
  - Where did it happen? For example, on a particular system, or within a particular procedure or table.
  - What is the extent of the problem? For example, is your production system unavailable, or is the impact less severe? Is the problem getting worse?

  Keep in mind what did *not* happen, as well as what did happen.
- ❑ Copies of any trace files, core dumps, or log files recorded near the time of the incident.

For installation-related problems, please have the following information available:

- ❑ Listings of the contents of the `ORACLE_HOME` directory, and any staging area, if applicable.
- ❑ Contents of the installation log files in the `$ORACLE_HOME/orainst` directory: `install.log`, `sql.log`, `make.log`, and `os.log`.

For more information, see http://www.oracle.com/support

Related Documentation

Additional information about migrating or upgrading from a previous release of the Oracle Server is provided in the *Oracle8 Migration Guide.*

Information about system administration and tuning for a production database system is provided in these documents:

- *Oracle8 Administrator's Reference for Sun SPARC Solaris 2.x*
- *Oracle8 Tuning*
- *Oracle8 Administrator's Guide*
- *Net8 Administrator's Guide*

Unfamiliar with the concepts or terminology associated with relational database management systems? Read Chapter 1 in *Oracle8 Concepts* before beginning your installation.

Ordering Related Documentation

To order documentation, call the appropriate number listed below.

- In the United States, call Documentation Sales at: **1.800.252.0303.**
- In the United Kingdom, call Oracle Direct Response at: **+44.990.332200.**
- In other European countries, contact your local Oracle Support office.
- In the Asia-Pacific region, contact your Oracle sales representative.

Shipping Inquiries

For shipping inquiries, product exchanges, or returns, call the appropriate number listed below.

- In the United States, call Client Relations at: **1.650.506.1500.**
- In the United Kingdom, call Customer Relations at: **+44.990.622300.**
- In other European countries, contact your local Oracle Support office.
- In the Asia-Pacific region, contact your Oracle sales representative.

1

Requirements and Features

Completing a quick, successful installation depends on the local system satisfying the software dependencies and space requirements for Oracle software. This chapter describes the requirements for installing the Oracle8 Server, Release 8.0.6 for Sun SPARC Solaris 2.x. Verify that the system meets the requirements described in this chapter before starting the installation.

- Installation Overview
- System Installation Requirements
- Operating System and Installation-Specific Issues and Restrictions

Installation Overview

Installing the Oracle8 Server involves the following steps:

1. *Satisfy Prerequisites:* make sure the local system satisfies the hardware, software, memory, and disk space requirements for the products you want to install. See Chapter 1 of this manual. If you are upgrading an existing installation, see Chapter 5, “Upgrading and Migrating”.
2. *Check the UNIX Environment:* make sure the UNIX environment is properly set up for the products you want to install. See Chapter 2, “Setting the Environment” of this manual.
3. *Install:* use the Installer to install the Oracle software. See Chapter 3, “Installation Tasks” of this manual.
4. *Post-Installation:* create database objects, establish the user environment, and configure the installed Oracle products for the local system. See Chapter 4, “Configuring the Oracle8 System” of this manual.
5. *Client Installations:* install Oracle tools, applications, and client interfaces, in accordance with the installation guides for those products.

System Installation Requirements

Verify that your system meets the installation requirements described in the following sections before you install the Oracle8 Server.

Hardware Requirements

Table 1–1 Hardware Requirements

Hardware	Requirements
Memory	A minimum of 64 MB RAM is required. 128 MB is recommended if you are using the ConText Cartridge.
Swap Space	In general, three times the amount of RAM is recommended. In systems with large amounts of memory (more than 1 GB), this can be reduced to two times the amount of RAM or less.
Disk Drives	At least four devices: one for the Oracle software distribution and three for creating an OFA-compliant database. **Note:** To improve performance and fault tolerance, Oracle Corporation recommends that disk space be spread across many, smaller drives, rather than a few, large drives.
Disk Space	At least 600 MB is required when installing the entire Oracle8 Server distribution. Less space is required if installing only a subset of the available products.
CD-ROM Device	A CD-ROM drive supported by Solaris is required. Oracle uses High Sierra or ISO 9660 format CD-ROM disks with RockRidge extension.

Operating System Software Requirements

Table 1–2 Operating System Software Requirements

OS Software	Requirements
Operating System	Solaris 2.5.1, 2.6, or 2.7 (SunOS 5.5.1 or 5.6)
Operating System Patch	Use the latest kernel patch from Sun Microsystems.
Window Manager	Use any Sun supported window manager, for example, `dtwm`, `twm`, `olwm`.

To determine which operating system patches are installed, enter the following command:

```
$ showrev -p
```

To determine which operating system packages are installed, enter the following command:

```
$ pkginfo -i [package_name]
```

If you enter `pkginfo -i`, all installed packages are listed.

Additional Product-Specific Installation Requirements

This section provides product-specific information additional to hardware and software requirements provided earlier in this chapter.

Table 1–3 Restrictions, Requirements, and Installation Tasks for Server, Options, and Cartridges

Product Name	Restrictions and Requirements	Required Tasks for Successful Installation
Oracle8 Server, 8.0.6	None.	Complete all pre-installation, installation, and post-installation tasks.
Oracle8 Objects Option, 8.0.6	Only available with Oracle8 Enterprise Edition.	None.
Oracle8 Parallel Server Option, 8.0.6	Only available with Oracle8 Enterprise Edition. The Oracle8 Parallel Server Option requires Sun SPARCcluster PDB 1.2 or higher.	Complete ”Pre-Installation Steps for Oracle Parallel Server Option” in Chapter 2. Complete “Post-Installation Steps for Oracle Parallel Server Option” in Chapter 4. Note: Migration and upgrade requirements are described in ”Complete Pre-Upgrade Tasks” in Chapter 5.
Oracle8 Partitioning Option, 8.0.6	Only available with Oracle8 Enterprise Edition.	None.
Oracle8 ConText Cartridge, 2.4.6	Requires an installed Oracle8 database.	Complete ”Post-Installation for Oracle ConText Cartridge” in Chapter 4. Note: Migration and upgrade requirements are described in ”Complete Pre-Upgrade Tasks” in Chapter 5.
Oracle8 Spatial Cartridge, 8.0.6	Only available with Oracle8 Enterprise Edition.	None.
Oracle8 Time Series Cartridge, 8.0.6	Only available with Oracle8 Enterprise Edition.	Complete ”Post-Installation Steps for Oracle8 Time Series Cartridge” in Chapter 4.
Oracle8 Image Cartridge, 8.0.6	Only available with Oracle8 Enterprise Edition.	None.
Oracle8 Visual Information Retrieval Cartridge, 8.0.6	Only available with Oracle8 Enterprise Edition. Requires Oracle8 Image Cartridge.	None.
PL / SQL, 8.0.6	None.	None.

Table 1–4 Restrictions, Requirements, and Installation Tasks for Tools and Precompilers

Product Name	Restrictions and Requirements	Required Tasks for Successful Installation
Java Database Connect (JDBC)8.0.6, including JDBC OCI Driver and JDBC Thin Driver	Requires JDK release 1.0.2, 1.1.1, or 1.1.7.	Complete "Pre-Installation Steps for JDBC" in Chapter 2.
Migration Utility (Oracle7 to Oracle8), 8.0.6	None.	None.
Object Type Translator, 8.0.6	None.	None.
Oracle Installer, 4.0.3	None.	None.
Oracle Online Text Viewer, 1.0.1	None.	None.
Oracle Server Manager: Line Mode, 3.0.6	None.	None.
Pro*COBOL, 8.0.6	Requires Micro Focus COBOL 4.0 or higher, or Sun Nihongo COBOL 1.0.1.	Complete "Pre-Installation Steps for the Pro*COBOL Precompiler" in Chapter 2.
Pro*COBOL, 1.8.28	Requires Micro Focus COBOL 4.0 or higher, or Sun Nihongo COBOL 1.0.1.	Complete "Pre-Installation Steps for the Pro*COBOL Precompiler" in Chapter 2.
Pro*C / C++, 8.0.6	Requires SPARCworks C compiler 4.2 or higher.	Complete "Pre-Installation Steps for the Pro*C / C++ Precompiler" in Chapter 2. Complete "Post-Installation Steps for Oracle Precompilers" in Chapter 4.
Pro*FORTRAN, 1.8.28	Requires FORTRAN77 4.0 or higher.	Complete "Pre-Installation Steps for the Pro*FORTRAN Precompiler" in Chapter 2.
SQL*Module Ada, 8.0.6	Requires Sun Ada 2.1 or higher.	Complete "Pre-Installation Steps for the SQL*Module Ada" in Chapter 2.
SQL*Plus, 8.0.6	None.	None.

Table 1–5 Restrictions, Requirements, and Installation Tasks for Networking and System Management Products

Product Name	Restrictions and Requirements	Required Tasks for Successful Installation
Oracle8 Advanced Networking Option: Security - Export Version, 8.0.6	Only available with Oracle8 Enterprise Edition. See Table 1–6 for information about ANO authentication adapter requirements.	Complete "Pre-Installation Steps for the Advanced Networking Option (ANO)" in Chapter 2.
Legato Storage Manager, Version 5.5	See Table 1–7 for Legato Storage Manager Software Requirements. **Note:** This product is only installable by selecting to install the database.	Complete "Pre-Installation Steps for Legato Storage Manager (LSM)" in Chapter 2. Complete "Post-Installation Steps for Legato Storage Manager (LSM)" in Chapter 4. For more information, refer to the *Legato Storage Manager Administrator's Guide.*
Oracle8 Data Gatherer, 8.0.6	Requires Oracle Intelligent Agent.	For more information, refer to the *Oracle Enterprise Manager Configuration Guide* and the *Oracle Data Gatherer Installation and Configuration Guide.*
Oracle8 Parallel Server Management Components, 8.0.6	Only available with Oracle8 Enterprise Edition. Requires Oracle8 Parallel Server Option.	Complete "Pre-Installation Steps for Oracle Parallel Server Option" in Chapter 2. For more information, refer to the *Oracle Parallel Server Management Configuration Guide for UNIX*.
NIS Native Naming Integration, 1.0.1	None.	None.
Oracle Intelligent Agent, 8.0.6	None.	Complete "Post-Installation Steps for Oracle Intelligent Agent" in Chapter 4.
Oracle Names Server, 8.0.6	None.	Complete "Pre-Installation Steps for Oracle Names Server" in Chapter 2. Complete "Post-Installation Steps for Oracle Names Server (Optional)" in Chapter 4.

Table 1–5 Restrictions, Requirements, and Installation Tasks for Networking and System Management Products

Product Name	Restrictions and Requirements	Required Tasks for Successful Installation
Oracle Net8, 8.0.6	None.	Complete "Pre-Installation Steps for Oracle Net8" in Chapter 2. Complete "Post-Installation Steps for Oracle Net8" in Chapter 4. Note: Migration and upgrade requirements are described in "Complete Pre-Upgrade Tasks" in Chapter 5.
Oracle LU6.2 Protocol Adapter, 8.0.6	Sun SNA 9.0, or higher.	Complete "Post-Installation Steps for Oracle Protocol Adapters" in Chapter 4.
Oracle SPX/IPX Protocol Adapter, 8.0.6	Sun PC Protocol Services 1.1 is required for Solaris 2.5.1	Complete "Post-Installation Steps for Oracle Protocol Adapters" in Chapter 4.
Oracle TCP/IP Protocol Adapter, 8.0.6	None.	Complete "Pre-Installation Steps for the Oracle Protocol Adapters" in Chapter 2. Complete "Post-Installation Steps for Oracle Protocol Adapters" in Chapter 4.

Software Requirements for Networking Products

All network adapters require the underlying software and operating system libraries for the supported network. The network software must be installed and running *prior* to installation of the Oracle Net8 products. Refer to the operating system and third party vendor networking product documentation for more information. Oracle Net8 products require the specific release of Oracle8 Server and Oracle Net8 supplied with this release.

Table 1–6 describes requirements for authentication adapters supported by the Advanced Networking Option (ANO).

Table 1–6 ANO-Supported Authentication Adapters and Requirements

Adapter	Requirements
Kerberos	Kerberos release 5.4.2 or higher.
CyberSAFE	CyberSAFE Application Security Toolkit, release 1.1 or higher, installed on both Oracle client and server nodes. CyberSAFE Challenger, release 5.2.5 or higher, installed on the node running the authentication server. CyberSAFE Client installed on the Oracle client nodes.
SecurID	ACE/Server release 1.2.4 or higher or SecurID card from Security Dynamics.
Identix	Oracle Biometrix Authentication Server running on any production-release Oracle database, with fingerprint tables created.

No additional authentication adapter software is required to relink Oracle products. However, Oracle does not provide an authentication server for Kerberos, CyberSAFE, or SecurID. The appropriate authentication server for these adapters must be installed and configured separately.

Software Requirements for Legato Storage Manager

If you install Legato Storage Manager, make sure it is not already installed on your machine. You must de-install the existing version if you want to re-install.

Table 1–7 Legato Storage Manager Software Requirements

Components	Default Locations	Space Requirements
GUI	/usr/bin	23 MB
Daemon and utility command files	/usr/sbin	22 MB
Online client file and server indexes; media database	/nsr	100 MB
Online manual pages	/usr/man	1 MB

Disk Space and Memory Requirements

The total installed size of the Oracle8 Server distribution is approximately 600 MB. If you have at least this much disk space available under a single mount point, you have adequate disk space to install the Oracle8 Server distribution.

The minimum recommended RAM for running the products in this release is 64 MB. If you have at least this much memory available on the system, you have enough memory to run the products in this release.

> **Note:** 600 MB of disk space does not account for the size of your database, and 64 MB of RAM is the *minimum* amount required for running the products in this release. A production RDBMS supporting many users requires significantly greater disk space and memory.

If you are installing other Oracle products on the server machine—Oracle Developer tools or Oracle Applications, for example—you must take the space and memory requirements for those products into account separately. See the installation guides for the additional products to determine their space and memory requirements.

Operating System and Installation-Specific Issues and Restrictions

The following issues and restrictions may affect the installation or use of the Oracle8 Server on Solaris 2.x. You should also check the release notes that accompany this release, and the README file in the $ORACLE_HOME/rdbms/doc directory before using the Oracle8 Server, Release 8.0.6. README files for other products on the Oracle8 Server distribution are in the doc or admin/doc directories for the respective products.

Concurrent Process Limit

The number of concurrent Oracle processes (init*sid*.ora parameter PROCESSES) for each Oracle system is limited by the Solaris 2.x-imposed limit for the maximum number of semaphore identifiers.

File Systems

The Oracle Server must be able to verify that file writes have been made to disk. File systems that do not support this verification are not supported for use with Oracle, such as NFS based on the UDP protocol.

Migrating from Oracle7

The Migration utility is included with this release and makes it possible to migrate an Oracle7 Server, release 7.1.4 or higher to the Oracle8 Server. You cannot use the Migration utility when moving from a release 7.0 database to Oracle8.

Optimal Flexible Architecture

All new installations and all database creations performed with the Installer comply with the Optimal Flexible Architecture (OFA) standard, in that the Installer requires you to enter a value for ORACLE_BASE. If you need to create a non-OFA structure, the Installer allows you to specify the same value for ORACLE_BASE as you specify for ORACLE_HOME.

> **See Also:** OFA is described in detail in Chapter 1 of the *Oracle8 Administrator's Reference for Sun SPARC Solaris 2.x*.

Solaris 2.3 and 2.4

Solaris 2.3 and 2.4 are not supported for use with Oracle8, Release 8.0.6. You must be using Solaris 2.5.1, 2.6, or 2.7. See page 1-4 for details of operating system and patch level requirements.

Very Large Files

Oracle8 includes native support for large files (greater than 2 GB). Solaris 2.6 and 2.6 also support large files, however you should verify that your file system and volume manager do not impose file size limits. Some System V file systems have a 2 GB maximum.

2

Setting the Environment

Use this chapter to prepare your environment for installing the Oracle8 Server, after you have verified the system meets the requirements described in Chapter 1, “Requirements and Features”.

- UNIX Environment Summary
- Tasks to Perform as the root User
- Tasks to Perform as the oracle User
- Setup Tasks for Individual Oracle Products

> **Note:** If you already have an Oracle Server installed on the machine, go to Chapter 5, “Upgrading and Migrating”.

UNIX Environment Summary

Table 2–1 summarizes the environmental requirements for installing the Oracle8 Server. If your system fails to satisfy any listed requirement, perform the tasks listed on page 2-4 to page 2-8 as necessary to set up your environment to meet these requirements.

Table 2–1 UNIX Environment Summary

Environmental Factor	Requirement for Oracle
UNIX Kernel Parameters	SHMMAX 4294967295 **Note:** This setting does not affect how much shared memory is needed or used by Oracle, or the operating system. It is used only to indicate the maximum allowable size. This setting also does not impact operating system kernel resources. SHMMIN 1 SHMMNI 100 SHMSEG 10 SEMMNS 200 SEMMNI 70 SEMMSL Equal to or greater than the value of the PROCESSES initialization parameter.
Mount Points (Storage Devices)	At least four mount points, all at the same level of the directory structure. One is for the software, three are for an OFA-compliant database.
UNIX Groups for Oracle Roles	A UNIX group is required for the OSDBA role, and is usually named `dba`. The OSOPER role may belong to the same group as the OSDBA, or it may belong to a different group.
UNIX Accounts	A UNIX account dedicated solely to installing and upgrading the Oracle system. The account must be a member of the group used by OSDBA.
Local `bin` directory	A directory for software shared among Oracle users. The default location for this directory on Solaris 2.x is `/opt/bin`.
`oratab` file	Contains information about Oracle instances.
Permissions for File Creation	Set `umask` to `022`.
DISPLAY	Set to the machine name and monitor of the station from which you are connecting to the server machine.

Table 2–1 UNIX Environment Summary (Cont.)

Environmental Factor	Requirement for Oracle
LD_LIBRARY_PATH	Required for Oracle products using shared libraries. Must include `$ORACLE_HOME/lib`.
ORACLE_BASE	Not required, but recommended as part of an OFA-compliant installation. See page 2-10.
ORACLE_HOME	Set to the directory where the Oracle software will be installed.
ORACLE_SID	Specifies the instance name, or *sid* of the Oracle Server. Must be unique for Oracle instances running on same machine. Oracle Corporation recommends using four characters or fewer.
ORACLE_TERM	Required by all character mode and Motif mode Oracle products. See Table 2–4 for the range of values.
ORA_NLS33	Required when creating a database with character set other than US7ASCII. Set to `$ORACLE_HOME/ocommon/nls/admin/data`.
PATH	The search path must include all of the following: `$ORACLE_HOME/bin`, `/bin`, `/opt/bin`, `/usr/bin`, and `/usr/ccs/bin` **Note:** If you require `/usr/ucb` in your search path, place it after `/usr/ccs/bin` in the search order.
SRCHOME	Should be undefined when running the Installer. If SRCHOME is set, the Installer defaults to the location it specifies as the source of software to install.
TWO_TASK	Should be undefined when installing the Oracle8 Server (see page 2-12 for explanation).
TMPDIR	A directory with at least 20 MB available space where the *oracle* account has write permission. The default location on Solaris 2.x is `/var/tmp`.

Tasks to Perform as the root User

Log in as the `root` user and perform the following tasks as necessary to set up your environment for the Oracle8 Server:

- ❏ Configure UNIX Kernel for Oracle
- ❏ Create Mount Points
- ❏ Create UNIX Groups for Database Administrators
- ❏ Create UNIX Account to Own Oracle Software
- ❏ Create a Local bin Directory
- ❏ Create the oratab File

◗◗ Configure UNIX Kernel for Oracle

Configure the UNIX kernel Interprocess Communication (IPC) parameters to accommodate the SGA structure of the Oracle8 Server. You will not be able to start up the database if the system does not have adequate shared memory to accommodate the SGA.

1. Use the `ipcs` command to obtain a list of the system's current shared memory and semaphore segments, and their identification number and owner.

   Because the shared memory in Solaris 2.x is dynamically loaded, when you run `ipcs` you may receive a message that the shared memory facility is not in the system. The shared memory driver is loaded after the Oracle8 Server is executed. You can check the `/etc/system` file to verify that the system has been configured with enough shared memory.

2. Set the kernel parameters corresponding to:

   - maximum size of a shared memory segment (SHMMAX)
   - maximum number of shared memory segments in the system (SHMMNI)
   - maximum number of shared memory segments a user process can attach (SHMSEG)
   - maximum amount of shared memory that can be allocated system-wide (SHMMNS)

   The total allowable shared memory is determined by the formula:

   ```
   SHMMAX * SHMSEG
   ```

The parameters in Table 2–2 control the allocation of semaphores and shared memory. The recommended values are optimal for one instance and are based on the default `init`*`sid`*`.ora` file. If you plan to install more than one instance, or to modify the `init`*`sid`*`.ora` file extensively, set these parameters higher.

Oracle Corporation recommends you set these parameters as high as possible for the operating system; however, setting these parameters too high for the operating system can prevent the machine from booting up. Refer to the operating system documentation for parameter limits.

Table 2–2 Shared Memory and Semaphore Parameters

Parameter	Recommended Value	Description
SHMMAX	4294967295	The maximum size (in bytes) of a single shared memory segment.
SHMMIN	1	The minimum size (in bytes) of a single shared memory segment.
SHMMNI	100	The number of shared memory identifiers.
SHMSEG	10	The maximum number of shared memory segments that can be attached by a process.
SEMMNS	200	The number of semaphores in the system.
SEMMNI	70	The number of semaphore set identifiers in the system. SEMMNI determines the number of semaphore sets that can be created at any one time.
SEMMSL	equal to or greater than the value of the PROCESSES initialization parameter	The maximum number of semaphores that can be in one semaphore set. Should be equal to the maximum number of Oracle processes.

Following are lines you would add to the `/etc/system` file to configure the UNIX kernel with the minimum recommended values:

```
set shmsys:shminfo_shmmax=4294967295
set shmsys:shminfo_shmmin=1
set shmsys:shminfo_shmmni=100
set shmsys:shminfo_shmseg=10
set semsys:seminfo_semmns=200
set semsys:seminfo_semmni=70
```

3. Reboot the system if you have modified the kernel, shared memory, or semaphore parameters.

Create Mount Points

The Oracle8 Server requires at least four mount points when creating an OFA-compliant installation: one for the software and at least three for database files.

All software and database mount point names used for Oracle should match the pattern */pm* where *p* is a string constant and *m* is a fixed-length key to distinguish between mount points. Table 2–3 shows a sample naming scheme.

Table 2–3 Sample Mount Point Naming Scheme

Software Mount Point	Database Mount Points
/u01	/u02
	/u03
	/u04

See Also: Optimal Flexible Architecture is described in detail in Chapter 1 of the *Oracle8 Administrator's Reference for Sun SPARC Solaris 2.x*.

Create UNIX Groups for Database Administrators

The Installer assigns Oracle DBA and OPERATOR privileges to UNIX groups during Installation. Oracle documentation refers to these UNIX groups as the OSDBA and OSOPER groups. Members of these groups have DBA or OPERATOR privileges on the Oracle system by virtue of their membership in the corresponding UNIX groups. The group(s) you designate for these roles should be created before you start the Installer.

On Solaris 2.x, use the `groupadd` utility to create a group named `dba`. You can name the group something other than `dba`, but the Installer relinks the `oracle` executable if you do. If you plan to designate a separate group for the OSOPER group, create that group also.

The Installer offers the group you designate as OSDBA as the default choice for the OSOPER group. If you accept the default, there is effectively no OPERATOR role, because its privileges are simply a subset of the DBA privileges already assigned to the group.

Create UNIX Account to Own Oracle Software

The *oracle* account is the UNIX account that owns the Oracle distribution. You must run the Installer under this account.

On Solaris 2.x, use the operating system administration utility `useradd` to create an *oracle* account with the following properties:

Login Name	Can be anything, but this document refers to it as the *oracle* account.
Default GID	Corresponding to the OSDBA group.
Home Directory	Choose a home directory consistent with other user home directories. The home directory of the *oracle* account does not have to be the same as the ORACLE_HOME directory.
Login Shell	The default shell can be `/bin/sh`, `/bin/csh`, or `/bin/ksh`, but the examples in this document assume the Bourne shell (`/bin/sh`).

Note: The *oracle* account should be used only for installing and maintaining Oracle software. *Never* use it for purposes unrelated to the Oracle Server. Do not log in as a database user when using the *oracle* (UNIX) account.

Sites with multiple Oracle servers may install them under the same *oracle* account, or separate ones. If multiple installations share an *oracle* account, the DBAs for each installation have access to the other installations. If this presents security problems, install each Oracle system under a different *oracle* account.

Create a Local bin Directory

Having a common environment for Oracle users greatly simplifies system administration. Part of creating a common environment is creating a local `bin` directory, outside the ORACLE_HOME directory, for shared software.

1. Create a local `bin` directory, such as `/opt/bin`.
2. Verify that this directory is included in each user's PATH, and that the users have execute permissions on the directory.

The Installer places the `oraenv` (`coraenv` for the C shell) and `dbhome` scripts in `$ORACLE_HOME/bin`. After installation, the `root.sh` script copies the files to the `/opt/bin` directory. The Installer cannot place them there directly because you must not run the Installer as the `root` user.

Copying `oraenv` (`coraenv`) and `dbhome` to the local `bin` directory ensures they continue to provide a common environment, even if the search path is changed to point to a different ORACLE_HOME directory.

You can also place other software that you want accessible to all users in the local `bin` directory.

Create the oratab File

Information about Oracle instances is stored in the /var/opt/oracle/`oratab` file. You must be logged in as root to create the `oratab` file. However, the *oracle* user must own the `oratab` file. Run *`cdrom_mount_point`*`/orainst/oratab.sh` script to create or set the permissions of the `oratab` file in the `/var/opt/oracle` directory.

Tasks to Perform as the *oracle* User

Log in to the *oracle* account and perform the following tasks as necessary:

- ❑ Set Permissions for File Creation
- ❑ Set Environment Variables
- ❑ Update the Environment for Current Session

◗◗ Set Permissions for File Creation

Set `umask` to `022` to ensure `group` and `other` have read and execute permissions, but not write permission, on the files the Installer creates.

1. Enter the `umask` command to check the current setting.
2. If the `umask` command does not return `022`, set it in the `.profile` or `.login` file of the *oracle* account:

```
umask 022
```

◗◗ Set Environment Variables

Set the following environment variables in the `.profile` or `.login` file of the *oracle* account before starting the Installer. The syntax for setting environment variables is as follows.

For the Bourne shell:

variable_name=*value*; export *variable_name*

For the C shell:

setenv *variable_name value*

Note: You should not define environment variables with names that are identical to those used for Oracle processes, for example: `CKPT`, `PMON`, and `DBWR`.

ORACLE_HOME

Specifies the directory containing the Oracle software for a given Oracle Server release. The OFA-recommended value is `$ORACLE_BASE/product/`*`release`*. For example: `/u01/app/oracle/product/8.0.6`.

LD_LIBRARY_PATH
Required when using Oracle products that use shared libraries. Set LD_LIBRARY_PATH to include `$ORACLE_HOME/lib`, and the directory containing your Motif libraries. The default location for Motif libraries on Solaris 2.x is `/usr/openwin/lib` or `/usr/dt/lib`.

Oracle Corporation recommends that you do not include `/usr/ucblib` in your `LD_LIBRARY_PATH`. If you require `/usr/ucblib` in `LD_LIBRARY_PATH`, make sure it appears *after* `/usr/ccs/lib` in the search order.

ORACLE_BASE
Specifies the directory at the top of the Oracle software and administrative file structure. The OFA-recommended value is *`software_mount_point`*`/app/oracle`. For example: `/u01/app/oracle`.

ORACLE_SID
Specifies the Oracle system identifier, or *sid*, which is the name of the Oracle Server instance. Because the *sid* is incorporated into many filenames, Oracle Corporation recommends restricting it to no more than four characters, to avoid filename problems on heterogeneous systems.

ORACLE_TERM

Specifies the terminal definition resource file to be used with the Installer and other Oracle products. Table 2–4 lists terminal types and corresponding ORACLE_TERM settings.

Table 2–4 ORACLE_TERM Settings

Terminal Type	ORACLE_TERM Setting
ANSI terminal for SCO	ansi
AT386 console	386
AT386 xterm	386x
UnixWare terminal	386u
Solaris x86 xterm	386s
Data General 200	dgd2
Data General 400	dgd4
IBM High Function Terminal and aixterm (color)	hftc
IBM High Function Terminal and aixterm (monochrome)	hft
hpterm terminal and HP 700/9x terminal	hpterm
IBM 3151 terminal	3151
NCD X terminal with vt220 style terminal	ncd220
cmdtool/shelltool using a Sun type 4 keyboard	sun
cmdtool/shelltool using a Sun type 5 keyboard	sun5
vt100 terminal	vt100
vt220 terminal	vt220
Wyse 50 or 60 terminal	wy50
Wyse 150 terminal	wy150
xterm using a Sun type 4 keyboard	xsun
xterm using a Sun type 5 keyboard	xsun5

ORA_NLS33

Required if creating a database with a storage character set other than US7ASCII. Set ORA_NLS33 to `$ORACLE_HOME/ocommon/nls/admin/data` before starting the Installer or creating the database.

PATH
Verify that the search path includes all of the following:

- `$ORACLE_HOME/bin`, `/bin`, `/usr/bin`, and `/usr/ccs/bin`
- the local `bin` directory you created (see page 2-8)

> **Note:** If you require `/usr/ucb` in your search path, make sure it comes after `/usr/ccs/bin` in the search order.

SRCHOME
Should be undefined when running the Installer. If SRCHOME is set, the Installer defaults to the location it specifies as the source of software to install.

TMPDIR
Must specify a directory with at least 20 MB free space, where the Installer has write permission. On Solaris 2.x the default setting is `/var/tmp`.

TWO_TASK
Should be undefined when installing Server software. If TWO_TASK is defined and you are creating database objects, the Installer attempts to create the objects in the database specified by TWO_TASK.

Update the Environment for Current Session

After setting environment variables in the `.profile` or `.login` file of the *oracle* account, update the environment in the current shell session.

For the Bourne or Korn shell:

```
$ ./.profile
```

For the C shell:

```
$ source .login
```

Setup Tasks for Individual Oracle Products

Perform the steps as necessary for your installation. Tables 1–3 through 1–5 list any products that require pre-installation tasks.

Server, Cartridges, and Options

◗◗ Pre-Installation Steps for Oracle Parallel Server Option

When creating an Oracle Parallel Server system, the Installer installs Oracle products on one node, then copies the required set of files for each installed product to the other nodes in the cluster. After a complete installation, all nodes appear identical.

Observe the following file requirements when setting up for an Oracle Parallel Server installation:

Storage Type	Use raw devices for all control files, log files, and database files.
File Sizes	When the Installer prompts you for file sizes, specify at least 8 KB less than the raw device size. When specifying sizes in megabytes, specify 1 MB less than the device size. Control file size is determined by the Oracle8 Server. The minimum size is 220 KB. Make sure the raw volumes for control files are at least this size.

Complete the following steps before installing the Parallel Server Option:

Steps to Perform as the root User

1. Make sure you have an OSDBA group defined in the `/etc/group` file on all nodes of the cluster. The OSDBA group name and number (and OSOPER group if you plan to designate one during installation) must be identical for all nodes of a UNIX cluster accessing a single database. The default UNIX group name for the OSDBA and OSOPER groups is `dba`.
2. Create an *oracle* account on each node of the cluster so that:
   - the account is a member of the `OSDBA` group
   - the account is used only to install and update Oracle software
   - the account has write permissions on remote directories
3. Create a mount point directory on each node to serve as the top of your Oracle software directory structure so that:

- the name of the mount point on each node is identical to that on the initial node
- the *oracle* account has read, write, and execute privileges

> **See Also:** Recommended naming conventions for Oracle mount points are discussed on page 2-6.

4. Create raw volumes.

   All files associated with an Oracle Parallel Server database must reside on raw volumes so they can be accessed by all nodes in the cluster. Control and data files are shared by all instances. Each instance has its own log files, but all instances must have access to all log files during recovery.

5. Apply the PDB software patch that is provided on the Oracle distribution. To install the patch, follow the directions in the `ops_patch` directory on your CD-ROM. This patch provides the Oracle Group Membership Service (OGMS) and is required before you attempt to install Oracle Parallel Server.

6. Restart the cluster management software:

   ```
   # cd /opt/SUNWcluster/bin
   # pdbadmin startnode cluster_name
   ```

   For information about cluster management software and the `pdbadmin` command, see your Solaris 2.x documentation.

   Start the cluster software on each node of the cluster.

7. Set up user equivalence by adding entries for the other nodes in the cluster to the `.rhosts` file of the *oracle* account, or the `/etc/hosts.equiv` file.

   Exit the `root` account when you are done.

Steps to Perform as the *oracle* Account

1. Verify that the Distributed Lock Manager (DLM) is running:

   ```
   $ ps -ef | grep dlmd
   ```

   If the DLM program does not appear in the process listing, the lock manager is not running and you should repeat step 6 on page 2-14.

2. Check for user equivalence for the *oracle* account by performing a remote login (`rlogin`) to each node in the cluster. If you are prompted for a password, the

oracle account has not been given the same attributes on all nodes. The Installer cannot use the `rcp` command to copy Oracle products to the remote directories without user equivalence.

If you have not set up user equivalence, you must perform Step 7 in the previous section, "Steps to Perform as the `root` User".

Tools and Precompilers

Complete the tasks for the following tools and precompilers before installing them.

Pre-Installation Steps for JDBC

1. Update the environment variable CLASSPATH with the JDK release level:

   `$ORACLE_HOME/jdbc/lib/classes111.zip` (or `classes102.zip`)

2. Add the following to the LD_LIBRARY_PATH:

   `$ORACLE_HOME/lib`

Pre-Installation Steps for the Pro*COBOL Precompiler

1. Verify that the COBOL compiler executable is included in the PATH setting.
2. Verify that $COBLIB is in the LD_LIBRARY_PATH.
3. Set the COBDIR environment variable to the directory where the COBOL compiler is installed.

Pre-Installation Steps for the Pro*C/C++ Precompiler

Verify that the C compiler executable is included in the PATH setting.

Pre-Installation Steps for the Pro*FORTRAN Precompiler

Verify that the FORTRAN compiler executable is included in the PATH setting.

Pre-Installation Steps for the SQL*Module Ada

Verify that the Ada executable is included in the PATH setting, and that the Verdix Ada compiler configuration file has been set up in the `/etc/VADS` directory.

Pre-Installation Steps for Legato Storage Manager (LSM)

The LSM installation script modifies the following system files during installation:

- `/etc/rpc`

- `/etc/syslog.conf`

Make copies of the original versions of these files before you install Legato Storage Manager.

See Also: For more information, refer to the *Legato Storage Manager Administrator's Guide*.

Removing an Existing Legato Storage Manager Installation

If you want to install LSM from the Oracle distribution, but it is already on your system, you must first remove the installed version.

1. Become the `root` user and shut down the LSM daemons.

   ```
   # nsr_shutdown
   ```

2. Use the `pkgrm` command to remove individual Legato Storage Manager packages, or all of the Legato Storage Manager packages at the same time.

   WARNING: Some LSM software packages depend on each other. Remove packages only in the following order: ORCLserv, ORCLnode, ORCLclnt.

   The man pages have no dependencies and can be removed with other packages in any order.

   ```
   # pkgrm ORCLpackage_name
   ```

   where *package_name* is one of the following:

ORCLserv	LSM Server
ORCLnode	LSM Storage Node
ORCLclnt	LSM Client
ORCLman	LSM Man Pages

Networking and System Management Products

Network Manager is no longer provided for configuring your Oracle Network. SQL*Net version 2 configuration files are compatible with Oracle Net8, though some restrictions apply. README files for networking products are under the network/doc directory on the CD-ROM. The files contain detailed information on issues and restrictions for Net8.

◗◗ Pre-Installation Steps for the Advanced Networking Option (ANO)

If you intend to use any of the supported authentication adapters, use Table 2–5 to verify your system meets the requirements.

Table 2–5 Supported Authentication Adapters and Requirements

Adapter	Requirements
Kerberos	Kerberos release 5.4.2 or higher.
CyberSAFE	CyberSAFE Application Security Toolkit, release 1.1 or higher, installed on both Oracle client and server nodes.
	CyberSAFE Challenger, release 5.2.5 or higher, installed on the node running the authentication server.
	CyberSAFE Client installed on the Oracle client nodes.
SecurID	ACE/Server release 1.2.4 or higher. or SecurID card from Security Dynamics.
Identix	Oracle Biometrix Authentication Server running on any production-release Oracle database, with fingerprint tables created.

No additional authentication adapter software is required to relink Oracle products. However, Oracle does not provide an authentication server for Kerberos, CyberSAFE, or SecurID. You must install and configure the appropriate authentication server separately.

Installation of ANO on Client-Only Machines

Installing ANO on a client-only machine without a database requires that the TWO_TASK environment variable be set prior to installation. The TWO_TASK variable points to an alias representing the database on a server machine, allowing the user to install ANO in client-only mode.

> **See Also:** *Oracle8 Administrator's Guide* for more information about the TWO-TASK variable.

Pre-Installation Steps for Oracle Net8

Shut down all SQL*Net and Net8 listeners on the machine before installing Net8.

Pre-Installation Steps for Oracle Names Server

If you want to use a *well-known* Names Server, create an alias for the machine hostname to `oranamesrvr`*`[0-4]`* in the `/etc/hosts` file. For example:

```
128.128.44.123    sun1.eng    oranamesrvr0
```

You must also create the alias for the well-known Names Server on all server and client machines in the network. (A well-known Names Server is one that uses a default name, such that clients can find it on the network, without being individually configured.)

> **See Also:** Names Servers and well-known Names Servers are discussed in the *Oracle Net8 Administrator's Guide*.

Pre-Installation Steps for the Oracle Protocol Adapters

Before installing any protocol adapter, verify that the underlying network protocol is functioning and configured properly.

TCP/IP

The TCP/IP Protocol Adapter is installed automatically with all Oracle8 Server installations.

1. Verify that the network is functioning properly by transferring a test file using the `ftp` utility.

   ```
   $ ftp remote_server_name
   ftp> put test_filename
   ftp> get test_filename
   ```

Pre-Installation Steps for Oracle Security Server (OSS)

The machine that hosts OSS should be in a physically secure location.

3

Installation Tasks

This chapter describes starting the Installer and creating a new Oracle8 Server installation.

- Starting the Installer
- Installer Prompts
- Installing Documentation
- Verifying the Installer Session

This chapter does not discuss using the Installer for tasks other than a creating a new installation (such as installing a patch or relinking executables). For instructions on other Installer procedures and for installation troubleshooting, see Appendix A, “Using the Oracle Installer”.

Starting the Installer

Perform the following tasks to run the Installer:

- ❑ Mount the Product Installation CD-ROM
- ❑ Start the Installer

◗◗ Mount the Product Installation CD-ROM

If you are using Solaris Volume Management software (available by default on Solaris 2.x), the CD-ROM is mounted automatically to `/cdrom/oracle806` when you put it into the CD-ROM drive, and you can proceed to "Start the Installer".

If you are not using the Solaris Volume Management software, you must mount the CD-ROM manually. You must have `root` privileges to mount or unmount the CD-ROM manually. Be sure to unmount the CD-ROM before removing it from the drive.

1. Place the Product Installation CD-ROM in the CD-ROM drive.
2. Log in as `root` and create a CD-ROM mount point:

   ```
   $ su root
   # mkdir cdrom_mount_point
   ```

3. Mount the CD-ROM on the mount point and exit the `root` account:

   ```
   # mount options device_name cdrom_mount_point
   ```

Example 3–1 Mounting the CD-ROM Without Using Volume Management Software

```
$ su root
# mkdir /cdrom
# /etc/mount -r -F hsfs device_name /cdrom
# exit
```

Start the Installer

As the *oracle* software owner, change to the `orainst` directory that was previously mounted:

```
$ cd /cdrom_mountpoint/orainst
```

The Installer can be run in either Motif mode or character mode. To start the Installer, enter one of the following commands:

`./orainst /m` for Motif mode

`./orainst /c` for character mode

WARNING: Do not run the Installer as the root user.

Non-Interactive Installations

The Installer can record responses from one installation session, then use those responses for subsequent installations. This "silent mode" can be useful for performing numerous, similar installations. See "Default and Repeat Installations" on page A-3 for more information.

Installer Prompts

The Installer session is a series of prompts, each displayed in its own window.

Initial Installer Prompts

The initial Installer prompts appear for any Installer session, regardless of the task you are performing or products you want to install. You may select a default installation, or a custom installation.

> **Note:** To choose National Language Support for Oracle products, you must choose the custom installation option. Later in the Installer session you will select your preferred language. The Installer is available in American English only.

If you select a default installation and decide to create a database, the Installer copies pre-built data files to the specified mount points. This automatically creates a database by reusing the data files shipped on the CD and it creates new control files. This saves the time of loading the data dictionary creation scripts.

> **Note:** Pre-built data files are only used for a default installation.

Installation Type/README Files

The Installer offers a choice between a custom or default installation. If you specify the default path, the Installer displays the settings it will use and asks you to confirm them.

Installation Activity Choice

Specify the activity for which you want to use the Installer:

- Install, Upgrade, or De-Install Software
- Create / Upgrade Database Objects
- Perform Administrative Tasks

Installation Options

The Installer offers two basic options for installing software: Install New Product (with or without database object creation), and Add/Upgrade Software. You can install the Oracle8 Server using either option.

The Install New Product option creates an OFA-compliant directory structure. The Add/Upgrade Software option does not enforce OFA compliance, and does not let you create database objects in the same Installer session.

Unable to Access the oratab File

This prompt appears only if the Installer is unable to access the `/var/opt/oracle/oratab` file. Refer to "Tasks to Perform as the root User" in Chapter 2 to create the `oratab` file.

Installation Locators Appendix

If ORACLE_BASE is set in the environment, the Installer prompts you to confirm the setting for it and for ORACLE_HOME. If ORACLE_BASE is not set, the Installer prompts you for a software mount point, and to complete the pathname to the `ORACLE_HOME` directory.

The ORACLE_SID environment variable is an Oracle system identifier, which is the name of the Oracle Server instance.

Installation Log Files

The Installer creates four log files as records of the Installer session, one for each of the following categories of action: operating system, Installer, SQL, and makefile. The default location for installation logs is under the `$ORACLE_HOME/orainst` directory. If installation logs already exist, the Installer saves them as *`filename`*`.old`.

Install Source

Specify whether you are installing from CD-ROM or from a staging area. If you are installing from a staging area, you are further prompted to specify temporary or permanent staging area. The Installer deletes temporary staging areas as it proceeds through the installation. (See Appendix A for more information about staging areas.)

National Language Support

Specify a language for receiving screen messages from Oracle products with National Language Support (NLS). Note that this is the default language only; users and client applications can also set the language in which messages are displayed at

the session level. Installer prompts and messages are always displayed in American English.

> **See Also:** Appendix C, "National Language Support" provides further information on NLS.

Location of the root.sh Script

The Installer creates the script `root.sh` under the `$ORACLE_HOME/orainst` directory. The script must be run by the `root` user, following the installation. If a `root.sh` script already exists, the Installer asks whether to append new actions to it, or create a new script. In general, you should create a new file, unless you have a specific reason for appending actions to the existing file.

Software Asset Manager

The Software Asset Manager tracks the size of the distribution you have selected and the space available in the destination directory (the `ORACLE_HOME` directory). Select the products you want to install from the Available Products window and select the Install button. Depending on the products you select, you might see Installer prompts in addition to those described in this chapter.

Some products in the Software Asset Manager are grouped under categories, such as "Protocol Adapters" or "Precompilers." Categories are indicated by a plus sign to the left of the name. To expand a category name into its composite products, double-click on the category name (select and press [Return] in character mode).

> **Note:** None of the products in a category are installed if you only select the category name. You must select the composite products individually.

The Software Asset Manager screen is explained in detail in Appendix A.

OSDBA Group

The Installer displays the choices for a user group to be assigned Oracle DBA privileges. The default is the primary group for the *oracle* account. If this group is named anything other than `dba`, the Installer will relink the `oracle` executable after installation.

OSOPER Group

You can choose to give the more limited Oracle OPERATOR privileges to a separate UNIX group, which the Installer calls the OSOPER group. The default is the group

you specified as the OSDBA group, in which case no separate user group is granted OPERATOR privileges. If you choose a group other than dba, the Installer relinks the oracle executable.

If you created a group for OPERATOR privileges in Chapter 2, "Setting the Environment." enter the name at the prompt. If not, accept the default.

Instance Name

The instance name, or *sid*, should be a unique identifier, not more than four characters long. The instance name is specified by the environment variable ORACLE_SID. In single-instance installations, it is generally the same as the value of the DB_NAME initialization parameter.

> **Oracle Parallel Server only:** The *sid* for each instance in a Parallel Server cluster must be unique and should incorporate the name of the database it manipulates. For example, the instance names for the database PRO might be PRO1, PRO2, and PRO3.

Database Creation Prompts

The following prompts appear only if you use the Installer to create a database.

Storage Type: File System or Raw Devices

Specify whether storage is on raw devices or a file system. Only Oracle Parallel Server requires raw devices, though raw devices can also be used with single instance installations.

Number of Mount Points

If you are installing the Server (RDBMS), indicate if you want to follow the OFA recommendation to spread database objects across three mount points. While it is possible to specify a single mount point, or three mount points on the same drive, Oracle Corporation strongly recommends you spread your database across at least three, independent devices. If you accept this prompt, control and redo log files are spread across the mount points you specify.

Mount Point Locators

Oracle Corporation recommends that the database mount points you specify at this prompt be different from the software mount point you specified during the initial Installer prompts (see page 3-4).

Table 3–1 summarizes the default size and placement for the database the Installer creates. Remember that the database is intended as a sample database. You can customize the location of any file during installation, as well as the size of redo log or database files, but the database is not optimized for your environment. It is not intended as a production database.

Table 3–1 Default Database File Summary

File	Default Size	Minimum Size	Default Location (File System-Based)
Control Files (3 Files)	500 KB	database-dependent	*db_mount_point[1-3]*/oradata/*db_name*/control0*[1-3]*.ctl
Redo Log Files (3 Files)	500 KB	100 KB	*db_mount_point[1-3]*/oradata/*db_name*/redosid0*[1-3]*.log
SYSTEM	80 MB	5 MB	*db_mount_point1*/oradata/*db_name*/system01.dbf
ROLLBACK	15 MB	1MB	*db_mount_point1*/oradata/*db_name*/rbs01.dbf
TEMP	1 MB	260 KB	*db_mount_point1*/oradata/*db_name*/temp01.dbf
USERS	1 MB	200 KB	*db_mount_point1*/oradata/*db_name*/users01.dbf
TOOLS	25 MB	1 MB	*db_mount_point1*/oradata/*db_name*/tools01.dbf

Note: *db_name* is the value of the initialization parameter DB_NAME, which the Installer derives from the instance name you provide during the Installer session.

Character Set

Specify a storage character set for the database. The default is US7ASCII. Do not specify any character set other than the default, unless you set the environment variable ORA_NLS33 during pre-installation.

The storage character set you specify cannot be changed without recreating the database. However, Oracle NLS supports client applications using different character sets than the storage set. See Appendix C, “National Language Support” for a list of supported character sets.

National Character Set

Specify the national character set for the database. This is a second character set that can be used with specially declared columns. The default is the character set you specified as the database character set.

SYS and SYSTEM User Passwords

The default password for the SYSTEM account is `manager`. The default password for the SYS account is `change_on_install`. Oracle Corporation recommends that you change both these passwords at this point.

The dba and operator Group Passwords

The Installer asks if you want to set passwords for the UNIX groups to which you assigned Oracle DBA and OPERATOR privileges. Setting these passwords enables password authentication on SYSDBA and SYSOPER connections.

To connect to the database as SYSDBA or SYSOPER, a user must be a member of a UNIX group to which you assigned the DBA or OPERATOR roles, *and* enter the password you supply here.

Note: You can specify the passwords for the DBA and the OPERATOR roles manually with the `orapwd` utility after installation. You can also use the `orapwd` utility to disable remote connections.

Multi-Threaded Server

The Multi-Threaded Server (MTS) lets you conserve the number of processes and amount of memory for certain types of applications. MTS is best suited for systems with limited memory, running online transaction processing (OLTP) applications with few long-running transactions. Oracle InterOffice is an example of an application that is well suited to MTS.

Because a long-running transaction ties up an MTS process for the duration of the transaction, MTS is not recommended for systems where long-running transactions are common, such as decision support systems.

Oracle Parallel Server Prompts

The Installer session for Oracle Parallel Server differs somewhat from that of a single-instance installation.

Database Creation

Oracle Parallel Server can only use database objects that reside on raw volumes. Database objects should not be created on file systems.

You will be prompted for the pathnames of the raw volumes during the installation.

For information on creating raw volumes, refer to "Pre-Installation Steps for Oracle Parallel Server Option" on page 2-13.

Install on All Nodes in Cluster

Indicate whether you want to install on all nodes of the cluster at once, or only on the initial node. If you install only on the initial node, you must install on the other nodes in subsequent Installer sessions using the Install Oracle8 on Cluster option.

If you specify installation on all the nodes in the cluster, the Installer prompts you for the hostname and the `ORACLE_HOME` directory of the remote nodes (specify each node individually). You must enter a blank line at the List of Nodes screen after you have entered the remote nodes.

Note: If your installation action is neither default nor upgrade (normal), then the installer will only ask for the hostname of the remote node and use the local ORACLE_HOME for the remote node.

Installing Documentation

Oracle documentation comes in two categories: operating system-specific and product (sometimes called generic). Operating system-specific documentation is included on the software CD-ROM and can be installed during the software installation. Product documentation is provided on a separate CD-ROM, and can only be installed in a separate Installer session.

Both operating system-specific and product documentation are available in HTML and PDF formats.

How to Install Documentation

To install operating system-specific documentation, select UNIX Documentation from the list of available products during a software installation.

To install product documentation, use the following procedure:

1. Verify that the Installer is installed on the file system. The Installer cannot install files from the documentation CD-ROM unless it is running from the file system. If the Installer is not installed on the file system, install it before attempting to install documentation, following the instructions on page 3-4. Select the Oracle UNIX Installer from the Available Products window in the Software Asset Manager. If you have created a staging area, you can also run the Installer from there.
2. Start the Installer from the local disk (not from the CD-ROM).
3. At the Installation Activity Choice screen, choose the Install, Upgrade, or De-Install Software option.
4. At the Installation Options screen, choose the Install Documentation Only option.
5. Indicate HTML, PDF, or both formats.
6. From the Software Asset Manager screen, select Oracle8 Product Documentation.
7. Select the Install button. The Installer notifies you when it has completed installing the documentation.

Accessing installed documentation is discussed in Chapter 4, “Configuring the Oracle8 System.”

Verifying the Installer Session

Following installation, the Installer returns to the Software Asset Manager screen. Verify that all products selected are listed as installed products. Exit the Installer and go to Chapter 4, “Configuring the Oracle8 System.”

To create a database using the Installer, exit and restart the Installer, then choose the Create / Upgrade Database Objects option. Database creation prompts are described beginning on page 3-7.

4

Configuring the Oracle8 System

You must perform certain post-installation steps and configure the Oracle8 system after completing the Installer session. This chapter describes the required steps, as well as some optional ones.

- Tasks to Perform as the root User
- Tasks to Perform as the oracle User
- Post-Installation for Individual Oracle Products
- Accessing Installed Documentation

> **Note:** This chapter describes *basic configuration only*. The more sophisticated configuration and tuning typically required for production systems is described in product and operating system-specific administration and tuning guides.

Tasks to Perform as the root User

Log in as the `root` user and perform the following tasks:

- ❏ Run the root.sh Script
- ❏ Create Additional UNIX Accounts
- ❏ Verify Database File Security
- ❏ Update the oratab File
- ❏ Automate Database Startup and Shutdown (Optional)

◗◗ Run the root.sh Script

During the Installer session, the Installer creates the `root.sh` script in the `$ORACLE_HOME/orainst` directory. Running the script sets the necessary file permissions for Oracle products, and performs other `root`-related configuration activities.

```
# cd $ORACLE_HOME/orainst
# ./root.sh
```

If you have installed Oracle Parallel Server, you must run the `root.sh` script on every node in the cluster.

Messages Displayed by the root.sh Script

The `root.sh` script prompts you to confirm the environment before it performs any actions. If you need to reset the environment for any reason, terminate the `root.sh` script. If you terminate the script, you must re-run it; you do not need to run the Installer again.

Depending on the products you installed, messages are displayed to inform you of the progress of `root.sh`. You might also be prompted for user names and be given additional instructions.

◗◗ Create Additional UNIX Accounts

Each DBA on the system must have an account in the OSDBA group. Do not assign multiple users to the same account. Create these UNIX account with your system administration utility (`useradd`).

◗◗ Verify Database File Security

Sites using the Oracle8 Server configured in a way similar to a United States NCSC C2 or European ITSEC E3 security evaluation configuration must perform this task to ensure the integrity of the Oracle software installation. This task is optional if security is not an issue.

Many files must be protected to prevent unauthorized access to secure data. The recommended file modes and ownership are as follows:

- The *oracle* account should own all common system files and installation files.
- The OSDBA group should have read, write, and execute privileges on all common system files and installation files.
- No user outside the OSDBA group should have write access on any files or directories in an Oracle installation.

Table 4–1 summarizes the directory and file permissions for different types of files.

Table 4–1 Access Permissions on Oracle Directories and Files

Directories/Files	Permissions	Comments
All database, redo log, and control files (extensions for these files are typically `.dbf`, `.log`, and `.ctl`)	640	To maintain discretionary access to data, all databases, redo logs, and control files must be readable only by the *oracle* account and OSDBA group.
`$ORACLE_HOME/bin/`		The 6 sets the `setuid` bit so the executables run as the *oracle* user and `dba` group, regardless of who executes them.
■ the `oracle` executable, and some networking and security executables	6751	
■ all other executables	751 or 755	Must be writable by the *oracle* software owner, and executable by all users.
`$ORACLE_HOME/lib/`	755	The directory is readable, writable, and executable by the owner, readable and executable by all other users.
All files under `$ORACLE_HOME/lib/`	644	Provides read-only access to all users.
`$ORACLE_HOME/rdbms/log`	751	Restricts access to log files to the *oracle* account and OSDBA group.
Product subdirectories such as `rdbms/lib` or `proc/lib`, and the files in them	644	Provides read-only access to all users.
`$ORACLE_HOME/network/trace`	777 or 730	777 allows broad access to view and create trace files during development. Use 730 in a production environment to ensure that only members of the OSDBA group have access to trace files.
Administrative, SQL, and shell script files under product `admin` subdirectories	644	SQL scripts should typically be run as the SYS user.

◗◗ Update the oratab File

If you used Server Manager to create a database manually instead of using the Installer, you must ensure the system configuration is reflected in the `/var/opt/oracle/oratab file.`

Add an entry for each Server instance on the system in the following format:

ORACLE_SID:*ORACLE_HOME*:{Y|N}

where Y or N indicates whether you want to activate the `dbstart` and `dbshut` scripts (see the following task). The Installer automatically adds an entry for each database it creates.

◗◗ Automate Database Startup and Shutdown (Optional)

Automating database startup is optional, but automatic shutdown is recommended, because it guards against improper shutdown of the database.

The `dbshut` and `dbstart` scripts are located in the `$ORACLE_HOME/bin` directory, and can be used to automate database startup and shutdown.

The `dbstart` and `dbshut` scripts reference the same entries in the `oratab` file, so the scripts must apply to the same set of databases. For example, you cannot have `dbstart` automatically start up databases `sid1`, `sid2`, and `sid3`, and `dbshut` shut down only databases `sid1` and `sid2`. You can, however, specify that `dbshut` shut down a set of databases while `dbstart` is not used at all. To do this, include the `dbshut` entry in the shutdown file but omit the `dbstart` entry from the system startup files.

> **See Also:** Check your platform-specific documentation for a description of system startup and shutdown procedures.

Automating Database Startup and Shutdown:

To set up the `dbstart` and `dbshut` scripts so that they are called at system startup:

1. Edit the `/var/opt/oracle/oratab` file.

   Database entries in the `oratab` file appear in the following format:

   ORACLE_SID:*ORACLE_HOME*:{Y|N}

   where Y or N specifies whether you want the `dbstart` and `dbshut` scripts to start up and shut down the database.

2. Find the entries for all the databases that you want to start up. They are identified by the *sid* in the first field. Change the last field for each to Y.

3. Create a file named `dbora` in the `/etc/init.d` directory (if it does not already exist).

4. Create entries similar to the following at the end of the file (if they do not already exist). Be sure to give the full path of the `dbstart` utility.

```
# Set ORA_HOME to be equivalent to the ORACLE_HOME
# from which you wish to execute dbstart and
# dbshut
# set ORA_OWNER to the user id of the owner of the
# Oracle database in ORA_HOME
ORA_HOME=/u01/app/oracle/product/8.0.6
ORA_OWNER=oracle
if [ ! -f $ORA_HOME/bin/dbstart -o ! -d $ORA_HOME]
then
echo "Oracle startup: cannot start"
exit
fi
case "$1" in
'start')
# Start the Oracle databases:
su - $ORA_OWNER -c $ORA_HOME/bin/dbstart &
;;
'stop')
# Stop the Oracle databases:
su - $ORA_OWNER -c $ORA_HOME/bin/dbshut &
;;
esac
```

5. Link `dbora` by entering:

```
# ln -s /etc/init.d/dbora /etc/rc0.d/K10dbora
# ln -s /etc/init.d/dbora /etc/rc2.d/S99dbora
```

Tasks to Perform as the *oracle* User

Log in to the *oracle* account and perform the following tasks:

- ❑ Update UNIX Account Startup Files
- ❑ Apply Any Required Oracle Patches
- ❑ Set Initialization Parameters

◗◗ Update UNIX Account Startup Files

Update the startup files of the *oracle* account and the UNIX accounts of Oracle users.

Set Environment Variables

If you did not define LD_LIBRARY_PATH, ORACLE_BASE, ORACLE_HOME, and ORACLE_SID in the startup file of the *oracle* account before installing the Oracle8 Server, do so now. Set these variables to the values you entered during the Installer session. Table 4–2 shows the default Installer values (which you might have modified).

Table 4–2 Environment Variable Settings

Environment Variable	Default Setting
LD_LIBRARY_PATH	There is no default setting for LD_LIBRARY_PATH. See Chapter 2, “Setting the Environment” for requirements.
ORACLE_BASE	*software_mount_point*/app/oracle
ORACLE_HOME	$ORACLE_BASE/product/8.0.6
ORACLE_SID	There is no default setting for ORACLE_SID. If you do not remember the value you entered, you can find it listed in the $ORACLE_HOME/orainst/usrdfl.log file.
PATH	There is no default setting for PATH. Make sure the new $ORACLE_HOME/bin directory is included. See Chapter 2, “Setting the Environment” for other requirements.

Initialize the oraenv (coraenv) Script

Follow the instructions for a single-instance or multiple-instance configuration as appropriate.

Single-Instance Machine On a single-instance machine, include the following commands to initialize the `oraenv` (`coraenv`) file at the end of the `.profile` or `.login` file of the *oracle* account.

For the Bourne or Korn shell:

```
ORAENV_ASK=NO
.  /opt/bin/oraenv
```

For the C shell:

```
set ORAENV_ASK = NO
source /opt/bin/coraenv
unset ORAENV_ASK
```

Multiple-Instance Machine On a multiple-instance machine, include a list of instance names and the commands necessary to initialize the `oraenv` (`coraenv`) file at the end of the startup file of the *oracle* account. The value of ORACLE_SID you defined before the Installer session is the default instance name.

For the Bourne or Korn shell:

```
SIDLIST=`awk -F: '/^[^#]/{printf " %s", $1}'/var/opt/oracle/oratab`
echo "SIDs on this machine are $SIDLIST"
ORAENV_ASK=
. /opt/bin/oraenv
```

For the C shell:

```
set SIDLIST=`awk -F: '/^[^#]/{printf " %s", $1}'/var/opt/oracle/oratab`
echo "SIDs on this machine are $sidlist"
unset ORAENV_ASK sidlist
source /opt/bin/coraenv
```

Update Other Oracle User Startup Files

To create the same environment for all Oracle users, update each user startup file to include:

- `/usr/bin` and `$ORACLE_HOME/bin` in the PATH statement
- the following line at the end of the startup file:
  `. /usr/bin/oraenv`

  (or `source /usr/bin/coraenv` for C shell users)
- settings for ORACLE_BASE and ORACLE_HOME

Apply Any Required Oracle Patches

The Oracle8 Server release which this installation guide accompanies might include software patches that must be applied to the Server or other products. If patches are provided, apply them according to the instructions in the patch release notes.

Set Initialization Parameters

Oracle initialization parameters determine the character of an Oracle8 Server instance and its connection to a database. Initialization parameters can be divided into two groups, configuration parameters and tuning parameters.

- Configuration parameters define the relationship between the database and its environment and are specified in the `config`*`db_name`*`.ora` file.
- Tuning parameters determine the variable characteristics of an Oracle8 Server instance, and are specified in the `init`*`sid`*`.ora` file.

> **See Also:** Chapter 2 of the *Oracle8 Administrator's Reference for Sun SPARC Solaris 2.x* lists the initialization parameters default values. The *Oracle8 Reference* fully describes all Oracle initialization parameters.

Activate the Default init*sid*.ora File

The Installer creates the `init*sid*_0.ora` file, which does not contain information on rollback segments but is otherwise identical to the default `init*sid*.ora` file in the distribution. Though rollback segments are active and online at this point, they are not listed in the `init*sid*_0.ora` file. The `init*sid*_0.ora` file remains active until you shut down the instance. The next time you start up the instance, the default `init*sid*.ora` file is activated.

The default `init*sid*.ora` file shipped with the distribution is located in the `$ORACLE_BASE/admin/*sid*/pfile` directory. The file contains settings for small, medium, and large databases, with the settings for medium and large databases commented out. The size settings are relative to each other, but do not represent an empirical size of the database.

Modify init*sid*.ora Parameters

You can modify the initialization parameters in the `init*sid*.ora` (not `init*sid*_0.ora`) with a UNIX text editor. You can activate the modified `init*sid*.ora` file by shutting down and restarting the database.

Do not use symbolic character representations such as question marks (?) for ORACLE_HOME in parameter files.

Post-Installation for Individual Oracle Products

This section covers post-installation tasks for the following products:

- Post-Installation for Oracle ConText Cartridge
- Post-Installation Steps for Oracle8 Time Series Cartridge
- Post-Installation Steps for Oracle8 Server
- Post-Installation Steps for Oracle Parallel Server Option
- Post-Installation Steps for Oracle Precompilers
- Post-Installation Steps for JDBC
- Post-Installation Steps for the Pro*COBOL Precompiler
- Post-Installation Steps for the Pro*C/C++ Precompiler
- Post-Installation Steps for the Pro*FORTRAN Precompiler
- Post-Installation Steps for Oracle Net8
- Post-Installation Steps for Legato Storage Manager (LSM)
- Post-Installation Steps for Oracle Names Server (Optional)
- Post-Installation Steps for Oracle Protocol Adapters
- Post-Installation Steps for Oracle Intelligent Agent
- Post-Installation Steps for Oracle Security Server

Perform the product-specific steps as necessary for your installation.

If you want to access online documentation before you configure your Oracle installation, instructions for accessing that documentation are on page 4-24. It is not necessary to read product documentation before completing the configuration tasks in this manual, but more sophisticated tuning requires information in the product documentation.

Post-Installation for Oracle ConText Cartridge

The Oracle ConText Cartridge requires a significant amount of database space. If you intend to install the ConText Cartridge, take the following space requirements into account :

Table 4–3 Space Requirements for Oracle ConText Cartridge

Item	Size
ConText Data Dictionary[1]	5 MB
ConText Demonstration Tables[2]	negligible

[1] Required for the ConText Cartridge
[2] Optional with ConText Cartridge

Use the following procedure to install and configure the ConText Cartridge:

1. Verify that tablespaces exist to serve as default and temporary tablespaces for the ConText Cartridge. The ConText data dictionary should not be placed in the SYSTEM tablespace. If tablespaces for ConText Cartridge do not exist, create them before proceeding.

   See Also: *Oracle8 SQL Reference* for information on creating tablespaces.

2. Verify that the database is up and running, and that SQL*Plus is installed.
3. Start the Installer and select the Install New Product - Create DB Objects option.
4. At the Software Asset Manager screen, select only the ConText Cartridge, then select the Install button.
5. Answer the remaining prompts for installing the ConText Cartridge.
6. Make the following changes to the `init`*`sid`*`.ora` file after completing the Installer session:
   - set the TEXT_ENABLE parameter to TRUE
   - set the SHARED_POOL_SIZE parameter to at least 9000000 bytes.

Post-Installation Steps for Oracle8 Time Series Cartridge

These steps are performed by the Installer when the Create Database Objects option is selected.

Install the UTLREF package (needed by the cartridge)

1. As DBA, execute the following:

   ```
   SVRMGR> @ORACLE_HOME/rdbms/admin/utlrefld.sql
   ```

2. Create the ORDSYS account if needed (may already exist). As DBA, execute the following:

   ```
   SVRMGR> create user ORDSYS identified by <ORDSYS password>;
   ```

3. Set privileges for ORDSYS account. As DBA, execute the following:

   ```
   SVRMGR> grant connect,resource,create library to ORDSYS;
   ```

4. Install Time Series Cartridge types and stored procedures:

   ```
   SVRMGR> connect ORDSYS/ORDSYS_password
   SVRMGR> @ORACLE_HOME/ord/ts/admin/ordtinst.sql
   ```

Execute privileges will be granted to PUBLIC for all Time Series types and packages.

Post-Installation Steps for Oracle8 Server

Recovery Manager

Recovery Manager is an automated recovery utility that is installed as part of the Oracle8 Server. It stores information in a recovery catalog in a separate Oracle8 database. This second Oracle8 Server should be installed on a separate machine to provide maximum fault resistance.

> **Note:** Recovery Manager can also be used in a restricted mode without a recovery catalog, if the installation and maintenance of a second Oracle8 Server is impractical.

Perform the following steps if you want to create a recovery catalog:

1. Install an Oracle8 Server on a separate machine from any other Oracle8 Server, and create a database for the recovery catalog.

   If you choose not to write a custom script to create the database, create the default database with the Installer. The default database is adequate for the recovery catalog.

2. Create a user in the recovery catalog database to be the Recovery Manager user.

3. As the Recovery Manager user, run the `catrman.sql` script in the `$ORACLE_HOME/rdbms/admin` directory. Run the script using Server Manager line mode (not using SQL*Plus).

Multi-Threaded Server

Servers configured with MTS require a higher setting for the initialization parameter SHARED_POOL_SIZE. If you specified MTS during the Installer session, you should raise SHARED_POOL_SIZE in the `init`*`sid`*`.ora` file. In general, you should add 1 KB for each anticipated concurrent user.

> **Note:** You must start up the listener before starting up the database.

Post-Installation Steps for Oracle Parallel Server Option

Run root.sh Script on Remote Nodes

The Installer creates identical installations on each node of the cluster, but you must run the `root.sh` script on each node, individually.

Oracle Group Membership Services (OGMS) Trace Files

During normal operation, the OGMS daemon creates trace files in the `/tmp/.ogms` directory. Files in this directory are used for diagnostics and must not be deleted while OGMS is active.

Start up Instances

Although the Installer can start up a database in shared mode, only one instance is started during installation. You must start up the other Oracle instances using Server Manager after installation is complete.

1. To start the listener automatically when the machine is rebooted, log in as the `root` user and add a line similar to the following in the system startup file:

   ```
   su - oracle -c "opsd log=/tmp/opsd.log"
   ```

   The above entry is optional, the default is:

   ```
   /tmp/opsdlog
   ```

   On Solaris 2.x, the startup file is `/etc/init.d/dbora`.

2. Determine the node numbers for all nodes of the cluster, by entering:

   ```
   $ORACLE_HOME/opsm/utl/getnodelist -a"
   ```

3. Create the OPS configuration file, *`opsname`*`.conf`, and install on each node. This file contains parameters describing the configuration of OPS instances and related services.

Post-Installation Steps for Oracle Precompilers

Post-Installation Steps for JDBC

1. Update the environment variable CLASSPATH with the JDK release level:

   `$ORACLE_HOME/jdbc/lib/classes111.zip` (or `classes102.zip`)

2. Add the following to the LD_LIBRARY_PATH:

   `$ORACLE_HOME/lib`

Post-Installation Steps for the Pro*COBOL Precompiler

1. Verify that the COBOL compiler executable is included in the PATH setting.
2. Verify that `$COBLIB` is in the LD_LIBRARY_PATH.
3. Set the COBDIR environment variable to the directory where the COBOL compiler is installed.

Post-Installation Steps for the Pro*C/C++ Precompiler

Verify that the C compiler executable is included in the PATH setting.

Pro*C/C++

The configuration files `ottcfg.cfg` and `pcscfg.cfg` in `$ORACLE_HOME/precomp/admin` must be customized for your environment before using Pro*C. Use a text editor of your choice to delete the shipped contents of these files and customize them to your environment.

Post-Installation Steps for the Pro*FORTRAN Precompiler

Verify that the FORTRAN compiler executable is included in the PATH setting.

◗◗ Post-Installation Steps for Oracle Net8

Configuring your Oracle network is beyond the scope of this manual, and is covered in detail in the *Oracle Net8 Administrator's Guide*. However, to configure a minimal network before exploring the new features in Net8, use the following procedure:

1. The Installer creates a basic `listener.ora` file for the Server and places it in the `$ORACLE_HOME/network/admin/` directory. The file specifies a TCP/IP listener on port number 1521. Check the status of the listener.

   ```
   $ lsnrctl status
   ```

   If the listener is running, the output of the `lsnrctl status` command will be similar to the following:

   ```
   Connecting to (ADDRESS=(PROTOCOL=IPC)(KEY=PNPKEY))
   STATUS of the LISTENER
   ------------------------
   Alias                     listener
   Version                   TNSLSNR for Solaris: Version 8.0.6.0.0 - Production
   ...
   ```

   If the listener is not running, start it up:

   ```
   $ lsnrctl start listener
   ```

2. Reserve a port for the Net8 listener by making the following entry in the `/etc/services` file:

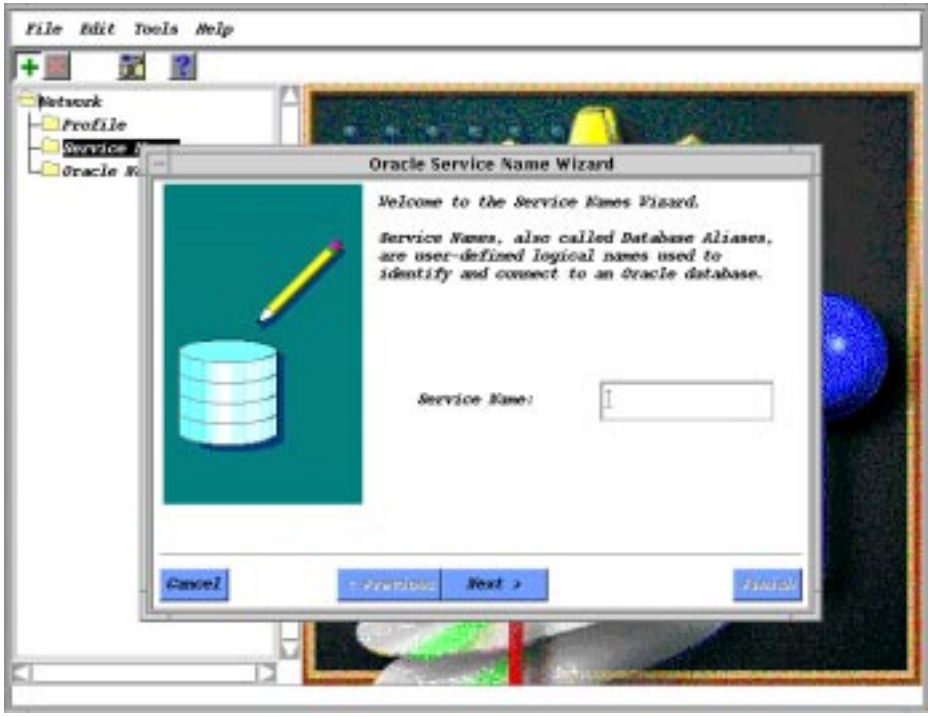
   ```
   listener 1521/tcp            #Oracle Net8 listener
   ```

3. Use the Net8 Assistant to create a `tnsnames.ora` file for client machines. The Net8 Assistant is in the `$ORACLE_HOME/bin` directory.

   ```
   $ cd $ORACLE_HOME/bin
   $ net8asst.sh
   ```

   Figure 4–1 shows the Net8 Assistant. To begin creating a `tnsnames.ora` file, select the Service Names icon and the Create button (the plus sign in the tool bar).

Figure 4–1 Net8 Assistant, Service Names Wizard



4. After creating a `tnsnames.ora` file, copy it to the `$ORACLE_HOME/network/admin` directories of client machines.

5. Test the connection by installing SQL*Plus on a client machine and attempting to connect to the Server:

   ```
   $ sqlplus username/password@service_name
   ```

   At this point you have established network connectivity over TCP/IP. For more advanced network configuration, refer to the *Oracle Net8 Administrator's Guide*.

Post-Installation Steps for Legato Storage Manager (LSM)

Legato Storage Manager installation is done via the `root.sh` script. Note that the prompts for the client and server portions of LSM are very similar, so do not be confused if you think you are being asked the same question twice.

1. After `root.sh` has completed the LSM installation, verify that all the required packages were installed:

```
# pkginfo | grep -i LSM
application ORCLclnt       LSM (Backup/Recover) Client
application ORCLman        LSM (Backup/Recover) Man
application ORCLnode       LSM (Backup/Recover) Storage Node
application ORCLserv       LSM (Backup/Recover) Server
```

2. Configure the driver software to provide support for Legato Storage Manager to back up data to the SCSI storage devices attached to the system. For more information, refer to the *Legato Storage Manager Administrator's Guide.*

Post-Installation Steps for Oracle Names Server (Optional)

Oracle Names Server is installed automatically with Oracle Net8. If you want to configure your network to use Oracle Names Server, do the following:

1. Use the Net8 Assistant to create the Oracle Names configuration files `sqlnet.ora` and `names.ora`.
2. If you are using well-known Names Servers, verify they are correctly aliased in the `/etc/hosts` file of all network nodes.
3. If you are using your machine as the server, start the Names Server process:

```
$ namesctl startup
```

4. Check the Names Server process:

```
$ namesctl status
```

Post-Installation Steps for Oracle Protocol Adapters

All Protocol Adapters

Perform the following steps after installing any Oracle protocol adapter.

1. Verify that you have created and installed the necessary configuration files for the network.

2. To start the listener automatically when the machine is rebooted, log in as the `root` user and add a line similar to the following in the system startup file:

   ```
   su - oracle -c "lsnrctl start"
   ```

   On Solaris 2.x, the startup file is `/etc/init.d/dbora`.

   > **Note:** This procedure fails if the TNS_ADMIN environment variable is not set in the `.profile` or `.login` file of the *oracle* account, or if `listener.ora` is not in one of the default locations (`/var/opt/oracle` or `$ORACLE_HOME/network/admin`).

3. If you have a client/server configuration, you must set the TWO_TASK environment variable on the client to point to the server. Set the TWO_TASK environment variable on the client machines to the service name for the server (available from the `tnsnames.ora` file).

4. Start the listener process:

   ```
   $ lsnrctl start
   ```

5. Check the listener process:

   ```
   $ lsnrctl status
   ```

6. As the *oracle* account, start the Server Manager, then test the connection with a loopback:

   ```
   $ svrmgrl
   SVRMGR> CONNECT username/password@service_name
   ```

   To test the connection from SQL*Plus:

   ```
   $ sqlplus username/password@service_name
   ```

SPX/IPX

1. Start the `ntisbsdm` executable before starting the Net8 listener:

   ```
   $ ntspxctl startup
   ```

2. Verify the `ntisbsdm` executable has started properly:

   ```
   $ ntspxctl
   ntspxctl> status
   ```

   Output similar to the following should be displayed:

```
ntisbsdm started at Tue Jul 21 10:01:39 1998
```

Note: Installation of the SPX/IPX adapter does not relink oracle, svrmgr1, sqlplus and many other binaries. It relinks Oracle Net8 binaries only. If the Oracle8 server is installed under ORACLE_HOME, relink the Oracle8 server binaries either through the Oracle Installer or manually by using:

```
$ cd $ORACLE_HOME/rdbms/lib
$ make -f ins_rdbms.mk install
```

Before relinking Oracle8 binaries, make sure that the Oracle database instance is not running.

Oracle Parallel Server

1. To start the listener automatically when the machine is rebooted, log in as the `root` user and add a line similar to the following in the system startup file:

   ```
   su - oracle -c "opsd log=/tmp/opsd.log"
   ```

   The above entry is optional, the default is:

   ```
   /tmp/opsdlog
   ```

   On Solaris 2.x, the startup file is `/etc/init.d/dbora`.

2. Determine the node numbers for all nodes of the cluster, by entering:

   ```
   $ORACLE_HOME/opsm/utl/getnodelist -a"
   ```

3. Create the OPS configuration file, *`opsname`*`.conf`, and install on each node. This file contains parameters describing the configuration of OPS instances and related services.

See Also: For more information, refer to the *Oracle Parallel Server Management Configuration Guide for UNIX*.

Post-Installation Steps for Oracle Intelligent Agent

The Oracle Intelligent Agent uses the Simple Network Management Protocol (SNMP). You must configure Oracle SNMP support before starting the Intelligent Agent. Note that all the configuration files for the following steps are located in the `$ORACLE_HOME/network/snmp/peer` directory.

Configure Master Agent

In the `CONFIG.master` file, perform the following tasks:

1. Search for the line beginning with `MANAGER`.
2. Change the `ipaddr` field, coded as `130.35.10.210`, to the IP address or hostname of the machine where you want SNMP trap messages sent.

Other changes can be made to the configuration file. Information about making such changes is located within the configuration file itself.

Configure the Encapsulator

1. Add the following line to the `snmpd.conf` file:

   `trap` *`hostname_or_IP_address`*

   where *hostname_or_IP_address* represents the local machine's IP address.

2. In the `CONFIG.encap` file, you can optionally modify the port number, which is set to 1161 in the default file. If you modify the port number, you must also modify the port number for NEW_SNMPD_PORT in the `start_peer` script.

   NEW_SNMPD_PORT is the port on which the `snmpd` agent (the native Solaris 2.x SNMP agent) listens. Make sure this is the same port as specified in the `CONFIG.encap` file. NEW_TRAPD_PORT is the PEER encapsulator port to which the `snmpd` agent sends traps.

   NEW_SNMPD_PORT and NEW_TRAPD_PORT in the `start_peer` script must have different port numbers. You may also modify the NEW_TRAPD_PORT port number.

Verify start_peer Script

The `start_peer` script contains a line like the following:

`SNMPD =` *`snmpd_executable_path`*

If the `snmpd` executable on your system is not in the location indicated by the `start_peer` script, edit *snmpd_executable_path* to indicate the correct location of the `snmpd` executable.

Start the SNMP Components

Perform the following steps to start the SNMP components:

1. Verify that the SNMP components, `master_peer`, `encap_peer`, and `snmpd`, are *not* running:

```
$ ps -aef | grep peer
$ ps -aef | grep snmp
```

If any of the components are running, log in as the `root` user and use the `kill` command to terminate the processes before proceeding.

2. As the `root` user, run the `start_peer` script to start the PEER master agent, PEER encapsulator, and native Solaris 2.x SNMP agent:

```
# cd $ORACLE_HOME/network/snmp/peer
# ./start_peer -a
```

> **WARNING: If you do not have the native Solaris 2.x SNMP agent on your system, you must *not* use the PEER Encapsulator. To start the master agent only, run `start_peer -m`.**

3. Verify that the SNMP components are running:

```
# ps -aef | grep peer
# ps -aef | grep snmp
```

Configure and Start the Database Subagent

Configuration and startup of the database subagent (the Oracle Intelligent Agent) is described in the *Oracle Enterprise Manager Configuration Guide*.

◗◗ Post-Installation Steps for Oracle Security Server

If you are unable to start up OSS after installing it, check the `$ORACLE_HOME/orainst/install.log` file for possible errors during installation.

If you install OSS in a subsequent Installer session, you must create the OSS Repository manually. Follow the instructions in the Oracle Net8 `README` file to do this.

Accessing Installed Documentation

Documentation can be installed in HTML or PDF (Adobe Acrobat) formats. To access the documentation, open the `index.htm` or `index.pdf` file at the top of your documentation hierarchy. The Installer installs documentation files according to the following rules:

- If ORACLE_DOC is defined in the environment, the Installer installs the files there.
- If ORACLE_DOC is not defined but ORACLE_BASE is defined, the Installer installs the files under the `$ORACLE_BASE/doc` directory.
- If neither ORACLE_DOC nor ORACLE_BASE are defined in the environment, the Installer installs the files under the `$ORACLE_HOME/doc` directory.

Generic documentation is installed directly under the ORACLE_DOC directory. Operating system-specific documents are installed under the `$ORACLE_DOC/server.806` directory.

You can also access documentation directly from the CD-ROM.

> **See Also:** Information on accessing documentation directly from CD-ROM is in the insert for the Documentation CD-ROM.

Oracle Information Navigator

Information Navigator is a Java-based search and navigation utility provided on the Oracle Documentation CD-ROM. If you are using a Java-enabled browser, Information Navigator is launched automatically when you open the `index.htm` file. Information Navigator can be used with Oracle product documentation, whether you are reading from CD-ROM or from installed files. Operating system-specific documentation can be accessed through Information Navigator only if both operating system-specific, and product documentation have been installed.

Text Viewers

Two browsers are provided with your Oracle distribution, one for character mode and one for Motif. You can install and use these browsers if you do not have one available on your system. The browsers do not support Java.

To install the browsers, run the Installer, specifying the Oracle Online Text Viewer at the Software Asset Manager screen. The Installer places the viewers under the `$ORACLE_HOME/orainst` directory as `gtr` (Motif) and `gtrc` (character mode).

To invoke a browser, change to the `$ORACLE_HOME/orainst` directory and enter the following:

```
$ ./oraview
```

The `oraview` script invokes the appropriate browser for your environment.

5

Upgrading and Migrating

This chapter describes the procedure for upgrading an Oracle Server installation on Solaris 2.x. Use this chapter in conjunction with *Oracle8 Migration*, which describes new functionality, backwards compatibility, and application migration issues.

- Selecting an Upgrade Method
- Pre-Upgrade Tasks
- Upgrading the Oracle Server
- Post-Upgrade Tasks

Selecting an Upgrade Method

Moving from an existing Oracle Server release to a newer release is referred to as an "upgrade." Every upgrade involves at least a software upgrade. An upgrade may require upgrading database objects and migrating the database, depending on the Oracle Server release from which you are upgrading. Figure 5–1 shows the additional procedures required for your system.

Definitions

Software Upgrade

A software upgrade installs the current release of the Oracle8 software on a system that has a prior release of the Oracle Server installed. Upgrading software might or might not require upgrading product database objects. A software upgrade does not alter data stored in the database, nor does it alter the data dictionary.

Note: Except for patch installations, Oracle Corporation strongly recommends that software upgrades be performed in a separate `ORACLE_HOME` directory from the existing installation.

Database Object Upgrade

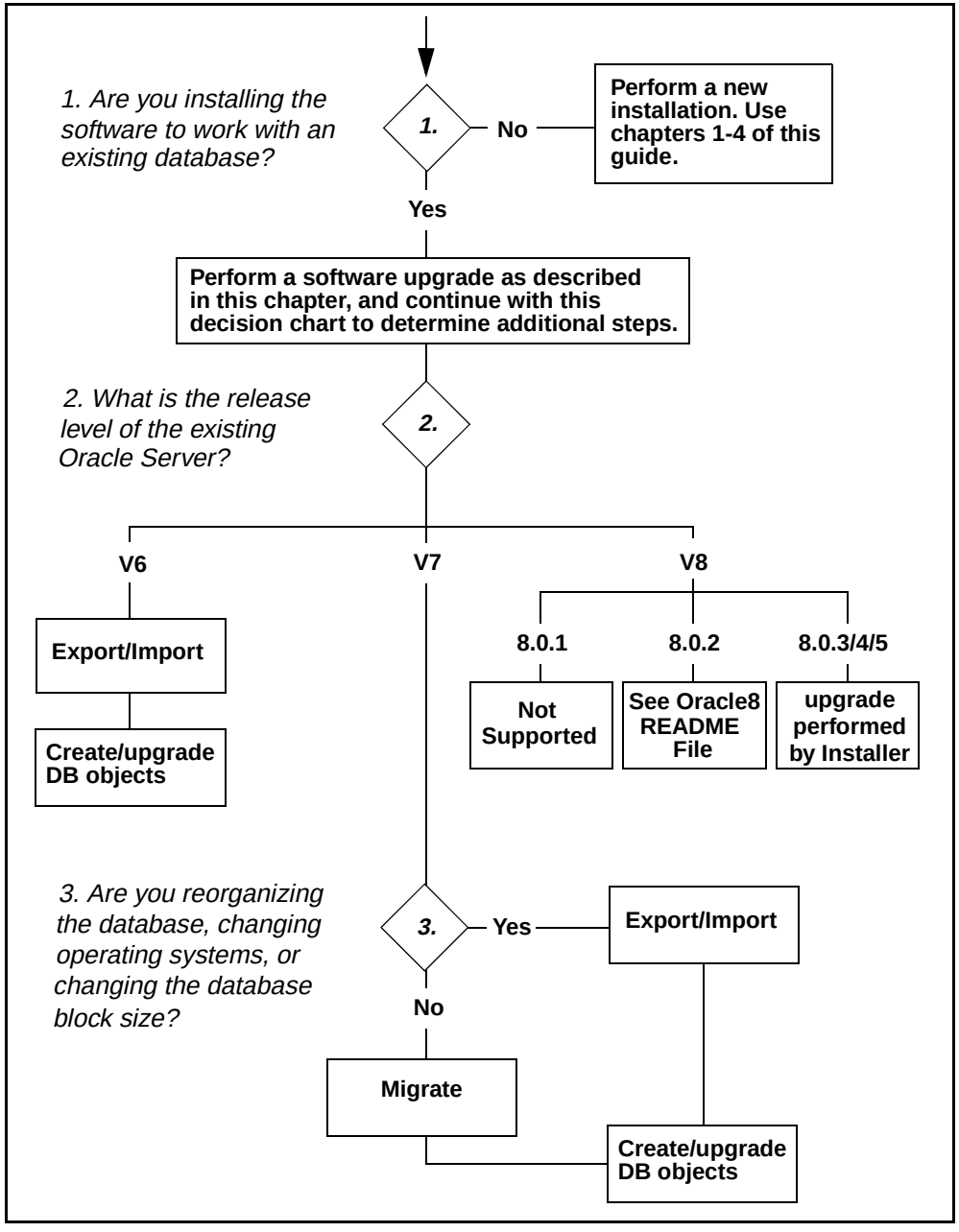
Some Oracle products use database roles, views, tables, or indexes for internal purposes. These database objects typically need to be upgraded when performing a major upgrade (for instance, if a view has been modified to provide more information). Information for determining if you must upgrade database objects is provided on page 5-16.

Database Migration

A database migration alters the data dictionary and other control structures to make an existing database conform to the definitions of a different Server release. Migration is performed in addition to a software upgrade, when moving between different Server versions, such as from Oracle7 to Oracle8. Migration is never used between two Oracle8 releases.

Migration can be accomplished with the Migration utility, which converts the structures in an existing database, or by performing an export/import, which copies the data from one database into the structures of another database.

Figure 5–1 Determining the Appropriate Upgrade Method



Restrictions and Other Considerations

New Naming Convention for Upgrade and Downgrade Scripts

Beginning with Oracle8 Release 8.0.5, there is a new naming convention for the upgrade and downgrade scripts. The scripts no longer use the form `CAT*.SQL`. The new naming convention provides direct migration paths from one release to another. The new names use the form `U*.SQL` for upgrading and `D*.SQL` for downgrading. The following two tables show the new upgrade and downgrade script names.

Table 5-1 Upgrade Scripts

Upgrading to 8.0.6 From:	Run Script:
8.0.2	`U0800020.SQL`
8.0.3	`U0800030.SQL`
8.0.4	`U0800040.SQL`
8.0.5	`U0800050.SQL`

Table 5-2 Downgrade Scripts

Downgrading to:	Run Script:
8.0.3	`D0800030.SQL`
8.0.4	`D0800040.SQL`
8.0.5	`D0800050.SQL`

Upgrading from Oracle Server Version 6

There is no facility for migrating directly from a version 6 Oracle Server to the Oracle8 Server. If you want to move from version 6 to Oracle8, you must first migrate to Oracle7 release 7.1.4 or higher.

Migrating and Block Size

To use the Migration utility, the Oracle7 and Oracle8 Servers must use the same database block size. If there is an entry for the DB_BLOCK_SIZE parameter in the Oracle7 `init`*`sid`*`.ora` file, do not change the setting. If you want to change the DB_BLOCK_SIZE for the Oracle8 Server you must use the export/import method.

Migrating Between Operating Systems

If you migrate between operating systems, as well as between versions of the Oracle Server, you must use the export/import method. The Migration utility does not support different operating systems in the source and destination environments.

Time Available

Export/import is slower than the migration utility, because it copies data out of the old database and into the new one. Migration is faster, especially for very large databases, because it makes changes only in the data dictionary of the existing database. Migration might be the only option for databases that require high availability.

System Resources

Export/import requires greater system resources than migration because exported data must be written to disk, and memory must be allocated for the export buffer.

Pre-Upgrade Tasks

Perform the following tasks before upgrading to the Oracle8 Server:

- ❑ Verify Environment Setup for Oracle8
- ❑ Back Up the Existing Oracle Database
- ❑ Comply with Pre-Installation Requirements for Oracle Products
- ❑ Complete Pre-Upgrade Tasks
- ❑ Prepare the Migration Utility
- ❑ Export the Full Database

◗◗ Verify Environment Setup for Oracle8

Confirm that the environment in which you are installing the Oracle8 Server meets the requirements for installation.

1. Check the system requirements listed in Chapter 1, "Requirements and Features." and the summary table in Chapter 2, "Setting the Environment" to make sure the environment meets all requirements for Oracle8.

   Note: On systems where more than one Oracle Server is installed under the same *oracle* account, it is essential that the environment be set to the Server you want to upgrade. This is especially true of the ORACLE_HOME, ORACLE_SID, and PATH environment variables.

2. Make a list of all products in the existing installation. Such a list is valuable during later stages of upgrading. One way to generate a list of installed products is to print the file `$ORACLE_HOME/orainst/unix.rgs`. The Installer uses this file as a registry of installed products and version numbers.

   Note: Products not installed with the Installer do not appear in the `unix.rgs` file.

Back Up the Existing Oracle Database

Perform a full backup of the existing Oracle database before you perform any upgrade. A full backup ensures that you can recover from errors encountered during the upgrade process.

> **WARNING: Oracle Corporation does not recommend or support the use of sparse files.**

This backup should be taken with the database shut down cleanly. If you must use SHUTDOWN IMMEDIATE or SHUTDOWN ABORT to force users off the system, be sure to restart the database in restricted mode, then shut it down with normal priority. Once you have taken the backup, do not restart the Server until you have completed the migration.

> **See Also:** "Backing up a Database," in the *Oracle Administrator's Guide*, or the *Backup and Recovery Handbook*.

Comply with Pre-Installation Requirements for Oracle Products

Table 1–3 lists the products included in the Release 8.0.6 distribution, and indicates restrictions and requirements for installation.

Complete Pre-Upgrade Tasks

Perform all pre-upgrade tasks before beginning to upgrade the Oracle8 Server installation.

Oracle8 Server

The Oracle Server must be shut down prior to being upgraded. If the Server is not shut down when you start the upgrade, the Installer will shut it down automatically.

Note that the Installer determines the database it will upgrade based on the user's environment. It is the responsibility of the user to ensure that the environment variables ORACLE_HOME and ORACLE_SID are set to the database you want to upgrade.

> **See Also:** *Oracle8 Migration* for information on issues and restrictions when upgrading to Release 8.0.6.

Oracle Parallel Server

When upgrading an Oracle Parallel Server, follow the instructions in this chapter to upgrade the initial node first. After upgrading the initial node, start a new Installer session and use the Install Oracle8 on Cluster option to upgrade the product software on additional nodes.

Oracle Net8

Shut down existing SQL*Net or Oracle Net8 listeners before starting installation.

◗◗ Prepare the Migration Utility

Perform this task only when migrating the database using the Migration utility. If you are unsure whether to use the Migration utility, see "Selecting an Upgrade Method" on page 5-2. To migrate the database using the export/import method, see "Export/Import" on page 5-16.

Install the Migration Utility

Install the Migration utility from the Oracle8 distribution into the *existing* `ORACLE_HOME` directory, using the Installer provided with the *new* release.

1. Start the Installer provided in the new release and select the Migrate from ORACLE7 to ORACLE8 option at the Installation Options screen.
2. Enter the pathname of the Oracle7 `ORACLE_HOME` directory name at the prompt.
3. Select the Install Migration Utility option from the Migration screen.
4. Select the Migration Utility: ORACLE7 to ORACLE8 from the Software Asset Manager screen and select the Install button. The Installer installs the following items:
   - the Migration utility executable, `mig`, in the `$ORACLE_HOME/bin` directory
   - the `migrate.bsq` script in the `$ORACLE_HOME/dbs` directory
   - required NLS files in the `$ORACLE_HOME/migrate/nls/admin/data` directory
5. The Installer notifies you when it has finished installing the Migration utility.

> **Note:** Ignore the message to run the `root.sh` script.

6. If you do not already have a list of installed Oracle7 products, use the Installed Products window of the Software Asset Manager to make one. The list is useful later in the migration.
7. Exit the Installer.

Verify Space in SYSTEM Tablespace

An Oracle8 database requires approximately 150% as much space in the SYSTEM tablespace as the equivalent Oracle7 database. Verify that the SYSTEM tablespace in your Oracle7 database is large enough, before migrating the database.

If your `init`*`sid`*`.ora` is in the default directory `$ORACLE_HOME/dbs`, you can verify space availability by running the Migration utility from the command line as follows:

```
$ mig SPOOL='"filename"' CHECK_ONLY=TRUE
```

Otherwise, you must specify the parameter PFILE in the Migration command:

```
$ mig PFILE='"initsid.ora_file"' SPOOL='"filename"' CHECK_ONLY=TRUE
```

◗◗ Export the Full Database

Perform this task only if you are planning to export/import the database.

Export the full database using the Export utility provided with the *source* database. See Chapter 1, "Export," in *Oracle7 Server Utilities* for detailed information on the Export utility and the available command line options.

> **Note:** If you are exporting to a database on a different operating system, be sure to use the RECORDLENGTH parameter in the `exp` command. On Solaris 2.x, the default record length is 32,768 bytes.

Upgrading the Oracle Server

Perform the following tasks to upgrade the Oracle Server:

- ❏ Set Environment Variables for New Server
- ❏ Install Oracle8 Server in New ORACLE_HOME Directory
- ❏ Update Parameter Files
- ❏ Migrate Database (If Necessary)
- ❏ Upgrade Product Database Objects
- ❏ Relocate Database Files to an OFA-Compliant Structure

◗◗ Set Environment Variables for New Server

Set the following environment variables in the `.profile` or `.login` file of the *oracle* account.

LD_LIBRARY_PATH
Add the `/usr/lib` and `$ORACLE_HOME/lib` directories for the new Oracle8 Server.

ORACLE_HOME
Set to the pathname of the new `ORACLE_HOME` directory (the Installer will create the directory if it doesn't already exist). For OFA-compliance, the new directory should be at the same level of the directory structure as the existing `ORACLE_HOME` directory. For example, if the existing `ORACLE_HOME` is `/u01/app/oracle/product/8.0.5`, the setting for the new Server would be `/u01/app/oracle/product/8.0.6`.

ORACLE_SID
Set to the *sid*, or instance name, of the existing Oracle Server, unless you plan to change the name of the instance and database for Oracle8. If you change the instance name for Oracle8, set ORACLE_SID to the new *sid*.

PATH
Add the full pathname of the new `$ORACLE_HOME/bin` before the existing `$ORACLE_HOME/bin`.

Update the current environment from the `.profile` or `.login` file after you have edited the file.

Install Oracle8 Server in New ORACLE_HOME Directory

Install the Oracle8 software in the new ORACLE_HOME directory using the Installer provided with the new release. Do not create database objects during this Installer session.

1. Start the Installer provided with the new release:

   ```
   $ ./orainst /m
   ```

   See Also: Chapter 3, "Installation Tasks" for detailed instructions on running the Installer.

2. Select the Install, Upgrade, or De-Install Software option at the Installation Activity Choice screen.
3. Select either the Install New Product - Do Not Create DB Objects, or Add/Upgrade Software option.
4. Enter the ORACLE_HOME directory for the new Oracle8 Server when prompted.
5. Select the products you want to install at the Software Asset Manager screen. Select the Install button to begin the installation.
6. Answer the remaining Installer prompts.
7. Exit the Installer when the software upgrade is complete.

Update Parameter Files

Modify the Oracle Server parameter files to reflect the new location of the Oracle software, relative to existing database files.

1. Copy the init*sid*.ora file from the existing location to the appropriate location in the Oracle8 directory structure.

   If you are following the OFA recommendations in this manual, the new location should be in the $ORACLE_BASE/admin/*sid*/pfile directory. If the database is not OFA-compliant, the location should be $ORACLE_HOME/dbs.

   If you are changing the name of the instance, rename the init*sid*.ora file accordingly. The name of the database (DB_NAME) cannot be changed.

2. In the `init`*`sid`*`.ora` file, change any question marks (?) or at signs (@) in pathnames to the full pathname of the `ORACLE_HOME` directory. For example, change the line:

   ```
   USER_DUMP_DEST = ?/admin/udump
   ```

   to

   ```
   USER_DUMP_DEST = /u01/oracle/admin/udump
   ```

   Question marks are interpreted as "the current value of ORACLE_HOME," so leaving them in the `init`*`sid`*`.ora` file will prevent the Oracle8 Server from locating the files in the updated environment.

3. Check the file for a CONTROL_FILES parameter entry in the following format:

   ```
   CONTROL_FILES = (location_of_control_files)
   ```

   Create or modify the CONTROL_FILES parameter by setting it to the absolute pathnames where the Oracle8 control files will reside. Note that you are *not* moving or changing the existing control files in any way; you are only specifying where the control files should be placed for the Oracle8 Server.

   Note: If you are migrating the database, the locations you specify for the control files *must* be empty. The actual control files are recreated during the database migration.

4. If the `init`*`sid`*`.ora` file contains an `ifile` (include file) entry, the entry specifies another file you must check, typically the `config`*`dbname`*`.ora` file. Locate the include file and copy it to the same directory as the `init`*`sid`*`.ora` file. Update the include file entry to point to the new version of the file, making sure the entry is an absolute pathname, not a relative one.

   Edit the include file as you did the `init`*`sid`*`.ora` file:

   - Change any question marks (?) in pathnames to the full name of the `ORACLE_HOME` directory.
   - Modify any CONTROL_FILES entry by setting it to the absolute pathnames of where new control files will reside.
   - If you are changing the name of the database, update the DB_NAME parameter and rename the file accordingly.

5. Check Appendix D, "Oracle8 INIT.ORA Changes" in *Oracle8 Migration* for other changes you must make in the `init`*`sid`*`.ora` file for Oracle8.

◗◗ Migrate Database (If Necessary)

If you need to migrate the database, use either the Migration utility or the export/import method; do not do both. If you do not need to migrate the database, proceed to "Upgrade Product Database Objects" on page 5-16.

Migration Utility

Run the Migration Utility Run the Migration utility that you installed in the Oracle7 `ORACLE_HOME` directory. You can run the utility from the command line, or by using the Installer provided with the new Oracle8 release. The following procedure describes running the Migration utility through the Installer.

1. Set the ORACLE_HOME, ORACLE_SID, and PATH environment variables to refer to the Oracle7 installation. (Remember that you set these for the new Oracle8 installation before you performed the software upgrade.)
2. Set the ORA_NLS33 environment variable to the `$ORACLE_HOME/migrate/nls/admin/data` directory.
3. Be sure that you know the locations of the control files and `init`*`sid`*`.ora` file.
4. Start the Installer provided with the new distribution. At the Installation Activity screen, choose the Install, Upgrade, or De-Install Software option.
5. At the Installation Options screen, select the Migrate from ORACLE7 to ORACLE8 option.
6. Select the Run Migration Utility option at the Migration screen.
7. Enter the ORACLE_SID for the database to be migrated at the prompt.
8. Select the Migration Utility: ORACLE7 to ORACLE8 at the Software Asset Manager screen and select the Install button.

The Installer prompts you for the information necessary to invoke the Migration utility. Table 5–3 lists the prompts and provides additional information about them.

Table 5–3 Migration Utility Prompts

Prompt	Information
Enter *sid*	Enter the instance name, or *sid*, of the database you are migrating.
Do you want to be prompted for all command options?	Unless you are certain you can use all the default values, answer Yes to this prompt.
Spool output?	Spooling the output of the Migration utility gives you a record of the actions taken in the migration. If you decline this option, output is sent only to standard output.
Space-check only?	This Migration utility has the ability to check for adequate space in the SYSTEM tablespace. Accepting this prompt means that the utility will *only* check the space; it will *not* perform the migration.
DB_NAME = *sid*?	Specify if database name is the same as the *sid* (on single-instance systems they are generally the same).
Changing database name?	Indicate if you are changing the name of the database during the migration.
PFILE	Enter the path and filename of the `init.ora` parameter file to be used with the *sid* database.
NLS_NCHAR	If the value of the NLS_NCHAR is different from the value that the database was created with, enter the correct value for NLS_NCHAR.
MULTIPLIER	If the value for MULTIPLIER is different from the value that the database was created with, enter the correct value for MULTIPLIER.
Change character set?	If you want to change the storage character set during the migration, enter the new character set (valid character sets are listed in Appendix C, “National Language Support”).
Skip space checking?	If you are certain that the SYSTEM tablespace has enough space for the Oracle8 data structures, you can specify that the Migration utility not perform space calculations.

Table 5–3 Migration Utility Prompts (Cont.)

Prompt	Information
Information	The Installer displays the full command it will use to invoke the Migration utility. If any part of the command is unsatisfactory, you can select the Back button and re-enter answers to the prompts in this table.
Last chance...	Confirm or abort the migration. Despite the warning from the Installer, it is still possible to abort the migration after this point. Issuing the ALTER DATABASE statement (page 5-16) is the point beyond which you cannot halt the migration.
Information	The Installer reports whether the Migration utility has completed successfully.
Information	If there are additional databases under the `ORACLE_HOME` directory, you can migrate them by returning to the Software Asset Manager screen, then selecting the Migration utility and Install button again.
Rename or remove control files.	The Installer instructs you to rename or remove all control files used with the Oracle7 database.
Run the `root.sh` script.	You can ignore the prompt to run the `root.sh` script after migrating the database.

Complete the Migration Perform the following steps to complete migrating the Oracle7 database to Oracle8.

> **See Also:** *Oracle8 Migration* describes the Migration utility and its command options in detail. You should read Chapter 5 of *Oracle8 Migration*, "After Migrating the Database."

1. Move the conversion file `conv`*`sid`*`.dbf` from the Oracle7 `$ORACLE_HOME/dbs` directory to the Oracle8 `$ORACLE_HOME/dbs` directory. If the Oracle8 *sid* is different from the Oracle7 *sid*, rename the conversion file appropriately. Do *not* alter the conversion file in any other way.
2. Verify that the CONTROL_FILES entry in the parameter file(s) points to locations *without* control files.

3. Convert the database.

```
SVRMGR> STARTUP NOMOUNT
SVRMGR> ALTER DATABASE CONVERT;
SVRMGR> ALTER DATABASE OPEN RESETLOGS;
SVRMGR> @$ORACLE_HOME/rdbms/admin/cat8000.sql
```

> **WARNING: Converting the database is irreversible. You cannot migrate from Oracle8 to Oracle7.**

Export/Import

Create the New Database Because the Installer-created database is limited and intended primarily for testing purposes, Oracle Corporation recommends creating the database manually through Server Manager. See the *Oracle8 Administrator's Guide* for detailed information on creating a database.

Import the Exported Files Use the Import utility provided with the *target* database to import the files you previously exported. See Chapter 2, "Import," in *Oracle8 Utilities* for detailed instructions on importing data into an Oracle8 Server.

> **Note:** If you are importing from a database on a different operating system, be sure to use the RECORDLENGTH parameter in the `imp` command. The record length must match the record length used during export. On Solaris 2.x, the default record length is 32,768 bytes.

◗◗ Upgrade Product Database Objects

Some Oracle products use the database to store and manipulate information: Oracle ConText Option, for instance, stores its dictionary in a database table. The tables, indexes, and other objects created by Oracle products for internal use are called product database objects, and they usually need to be upgraded when product software is upgraded.

When Not to Upgrade Product Database Objects

As a rule, product database objects do not need to be upgraded during a minor upgrade: between release 2.1.1 and 2.1.2, for instance. Major upgrades—from 2.1 to 2.2 or 3.0, for instance—generally require any database objects to be upgraded. Products that do not follow this general rule include special instructions in their upgrade notes, which are listed in Table 1–3 through Table 1–5 in Chapter 1.

How to Upgrade Product Database Objects

To upgrade product database objects, select the Create / Upgrade Database Objects option at the Installation Activity Choice screen.

1. Start the Installer provided with the new Oracle8 release.
2. Select the Create / Upgrade Database Objects option at the Installation Activity Choice screen.
3. Select the Upgrade Database Objects option at the Database Options screen.
4. At the prompt, enter the location of the new `ORACLE_HOME` directory.
5. At the prompt, enter the ORACLE_SID for the database to be upgraded.
6. Select the products for which you want to upgrade database objects at the Software Asset Manager screen and select the Install button.
7. Select the version of the database you are upgrading at the DB Upgrade screen.
8. At the Database Action screen:
   - If the product was *not* part of the old release and you are installing it for the first time, select the Create Product DB Objects option.
   - If the product was part of the old release, select the Upgrade Existing Product DB Objects option.

   WARNING: Do *not* select the Create Product DB Objects option if the product was part of the old release. Consult the list of installed products you made during upgrade preparation as necessary.

Exit the Installer when the database object upgrade is complete. If there is more than one database under the `ORACLE_HOME` directory, perform this task for each database, supplying the appropriate ORACLE_SID each time you restart the Installer.

Relocate Database Files to an OFA-Compliant Structure

This task is not required, but it is recommended for simplifying future maintenance and upgrades. The goal of the procedure is to separate database files from software and administrative files in the directory structure. Then, when you upgrade in the future, you can install software in a new location and use the `init`*`sid`*`.ora` file to direct the instance to the existing database files. Once satisfied with the upgraded production environment, you can easily remove the old Oracle software, reclaiming disk space.

> **WARNING: If you retain the old Oracle software, never start the upgraded database with it. This can corrupt the database files. Start the upgraded database only with the executables in the new `ORACLE_HOME` directory.**

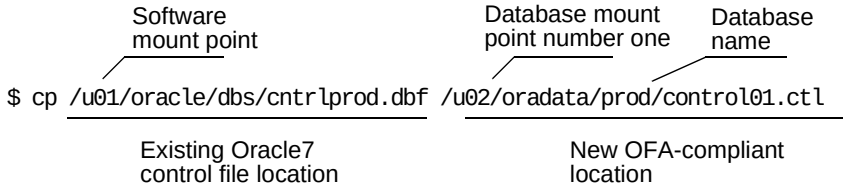
To relocate database files:

1. Change directories to the new `ORACLE_HOME` directory.
2. Start Server Manager and execute the following SQL commands to generate a list of database and log files, and write the filenames to a file (`file.list` in the example below).

```
SVRMGR> CONNECT INTERNAL
SVRMGR> SPOOL file.list
SVRMGR> SELECT * FROM v$dbfile;
SVRMGR> SELECT * FROM v$logfile;
```

3. Shut down the database with the SHUTDOWN NORMAL command.
4. Back up the upgraded database. (The backup made during upgrade preparation is acceptable, as long as the database has not been opened since that backup was taken.)

5. Copy the control files to the new locations. If you follow the OFA recommendations in this manual, the new locations should be the *db_mount_point[1-3]*/oradata/*db_name* directories. The syntax for copying a file to its new location looks like the following:



   Use complete pathnames. Do not use variable syntax like $ORACLE_HOME or $ORACLE_BASE in the path when specifying the new locations.

6. Change the CONTROL_FILES entry in the parameter file (init*sid*.ora or config*dbname*.ora) to reflect the new location of the control files.

7. Copy the data files and log files to their new locations. Specify the new file locations using complete, absolute pathnames.

   If you are following the OFA recommendations in this manual, the new location should be the *db_mount_point[1-3]*/oradata/*db_name* directory. See the file.list file for the list of files you must copy.

   You should also record the full pathnames of the new files for future reference.

8. Verify that the database is mounted and closed by executing the STARTUP MOUNT command from Server Manager.

9. Update the database with the new file locations by executing the ALTER DATABASE command. Check file.list for a list of the files to rename; use the list of filenames you recorded in Step 7 for the new filenames.

   The syntax for the ALTER DATABASE RENAME FILE command should look like the following:

```
SVRMGR> ALTER DATABASE
 2> RENAME FILE '/u01/oracle/dbs/log1.dbf'
 3> TO '/u02/oradata/prod/log01.dbf';
```

   Repeat the command for all files you must relocate. Always provide complete, absolute pathnames in the RENAME FILE clause.

10. Open the database by executing the ALTER DATABASE OPEN command.

11. Verify that all the database files and log files have the new names you specified.

    Create a `newfile.list` file in the same way you created `file.list` in Step 2, then compare the files. All the database files and log files listed in `file.list` should appear in their new locations in the `newfile.list` file.

    See Also: "Managing Datafiles," in the *Oracle8 Administrator's Guide*.

12. When you are certain the database files are successfully relocated and the `init`*`sid`*`.ora`, log, and control files are in their new locations, remove the old database files.

Post-Upgrade Tasks

- ❑ Check Post-Installation Tasks
- ❑ Notify Users

◗◗ Check Post-Installation Tasks

1. Run the `root.sh` script to complete the upgrade.

   See Also: Chapter 4, "Configuring the Oracle8 System."

2. Perform any post-installation tasks not completed during the software upgrade portion of the upgrade (such as completing installation of online documentation). Post-installation tasks are listed in Chapter 4, "Configuring the Oracle8 System" of this manual.

◗◗ Notify Users

Notify users to log out of the operating system and log back in. This activates the new `ORACLE_HOME` location for the upgraded database. It also runs the `oraenv` program, reads the new `oratab` file entry, and points users to the upgraded database.

A

Using the Oracle Installer

This appendix describes how to use the Installer for procedures other than first-time installations. First-time installations are described in Chapter 3, “Installation Tasks”.

- Creating Database Objects
- Default and Repeat Installations
- Upgrades and Patch Set Installations
- Other Installer Functions
- Troubleshooting

Creating Database Objects

The Installer can be used to create database objects for Oracle products. Database objects are logical structures such as tables, tablespaces, roles, views, and indexes that are stored in the database. In the case of the Oracle8 Server, the database object is the database and data dictionary.

Oracle Corporation recommends that you install software and create database objects in separate Installer sessions. While this might seem more complicated than having the Installer do both tasks in the same session, it simplifies debugging if you encounter problems during the Installer session.

Installer-Created Database Objects

It is possible to create product database objects for some products manually, rather than with the Installer, but Oracle Corporation recommends that you always use the Installer. Using the Installer ensures that objects are created properly and populated with appropriate data.

> **Note:** This recommendation does not apply to creating a database (the database object for the Oracle RDBMS). See "Installer-Created Database" on page A-3 for recommendations about creating a database.

Accepting Defaults

Some products have prompts associated with database object creation. Prompts regarding database objects typically fall into three categories:

- Object Location
- Object Size
- Schema Owner

Object Location

Default object location is usually based on the one tablespace common to all databases, the SYSTEM tablespace. SYSTEM, however, is rarely an acceptable location. Tables that grow rapidly, or that have rows added and deleted, result in fragmentation which can seriously degrade performance when it occurs in the SYSTEM tablespace.

Object Size

Object size usually depends on the anticipated size and usage of the system. The default sizes offered by the Installer are typically appropriate only for testing.

Schema Owner

Schema owner defaults should be accepted, unless you have a specific reason for doing otherwise.

Installer-Created Database

Oracle Corporation recommends using an Installer-created database for testing purposes only. The default database is fairly simple; it is OFA-compliant, but it is small and not optimized for any particular environment or usage. During its creation, you can specify different tablespace locations and sizes, but you cannot create any tablespaces other than the basic five: SYSTEM, ROLLBACK, TEMP, TOOLS, and USERS.

Default and Repeat Installations

The Installer provides two mechanisms to simplify and automate installation sessions:

- Default Installation Path
- Silent Mode (for Repeat Installations)

A default installation minimizes the number of Installer prompts by automatically selecting default values for the initial Installer prompts. Silent mode uses responses recorded during an earlier Installer session to answer prompts in the current installation. It is useful when performing numerous, similar installations.

Default Installation Path

The default installation path prompts you for the values of ORACLE_BASE, ORACLE_HOME, and ORACLE_SID. After you provide the required information, the Installer takes you to the Software Asset Manager screen, where you specify the products you want to install.

Table A–1 lists the Installer prompts that are not shown during a default installation, and the values the Installer uses.

Table A–1 Default Installer Values

Installer Prompt	Default Value
Installer log location	`$ORACLE_HOME/orainst/install.log`
SQL log location	`$ORACLE_HOME/orainst/sql.log`
Operating system log location	`$ORACLE_HOME/orainst/os.log`
Make log location	`$ORACLE_HOME/orainst/make.log`
Installation source	CD-ROM
Language	American / English
Root actions	Appended to existing `root.sh` file (if it exists)

You can also specify default or custom installation in the environment by setting the variable DEF_INSTALL to either TRUE or FALSE, before starting the Installer.

Silent Mode (for Repeat Installations)

Repeat installations are performed by creating a *response file* during an initial installation, then using the response file to provide answers to prompts during subsequent installations, when the Installer is running in silent mode.

> **Note:** Use silent mode only to install the same products you installed during the initial installation, or a subset of them.

Perform the following steps to use the Installer in silent mode:

1. Run the Installer for the initial installation, recording your answers to prompts in a response file.

   `$ ./orainst /rspdest` *`filename`*

   where *filename* is the full pathname of the response file where the Installer will record your answers. Be sure to specify a directory where the *oracle* account has write permission.

2. After the initial installation, edit the response file, changing any necessary values (for example: pathnames, mount points, ORACLE_SID). You can use any UNIX text editor.

3. Invoke the Installer, specifying the response file and products to install.

```
$ ./orainst /m /rspsrc filename /install products /silent
```

where:

filename	is the full pathname of the response file you created in a previous installation.
products	is a comma-separated (no spaces) list of products to install. Available products and the product names to use in the command line are available in the `unix.prd` file on the Oracle distribution.

Regardless of whether you are using the Installer in silent mode, you can set the environment so the Installer skips the display of README files. To skip README files, set the NO_README environment variable to TRUE, before starting the Installer.

Following is an example of the commands to invoke the Installer, create a response file, and then use that response file in a subsequent installation. The products specified for installation are the Oracle8 Server, Server Manager, and Oracle Names Server.

```
$ ./orainst /m /rspdest resp_806.rsp
$ ./orainst /m /rspsrc resp_806.rsp /install rdbms,svrmgrl,NAMES /silent
```

Upgrades and Patch Set Installations

Table A–2 describes the terminology and release numbering associated with different types of Oracle releases. Regardless of the type, use the Installer to perform the upgrade.

Table A–2 Upgrade Terminology and Release Level

Type of Release	"Significant Figure" in Release Level	Scope of Release
New Release, or Major Upgrade	First and second level: 7.2, 7.3, 8.0	Major functionality or architectural changes
Upgrade, or Maintenance Upgrade	Third level: 7.7.2, 7.3.3	Bug fixes and minor new functionality
Patch Set	Fourth level: 7.3.3.1, 7.3.3.2	Bug fixes only

New releases and maintenance upgrades are always complete software distributions, and should be installed in separate `ORACLE_HOME` directories from existing Oracle Servers. Patch sets are never complete software distributions, and must always be installed on top of an existing release.

Patch Sets

Oracle Corporation Patch Sets

Patch sets are Oracle Corporation's mechanism for delivering fully tested and integrated product fixes on a regular basis. Patch sets provide bug fixes only; they do not include new functionality, and do not require re-certification on the target system.

What Goes Into a Patch Set?

Patch sets include only the libraries affected by the bug fixes in the set. All the fixes in a patch set have been tested and are certified to work with each other. Because a patch set includes only low-impact patches in RDBMS and PL/SQL libraries, it does not require you to recertify applications or tools against the Server.

Patch sets are cumulative, and contain the same set of generic fixes across all platforms. For example, patch set 7.3.3.2 contains patch set 7.3.3.1, plus the bug fixes since that set. Patch set 7.3.3.2 for Hewlett-Packard addresses the same set of bugs as 7.3.3.2 for Digital UNIX. Note, however, that patch sets may also include a small number of patches specific to the platform on which they are released.

Patch sets do not include the Installer (`orainst`) in their distribution. You must use the Installer from the baseline release (for example, 7.3.3, if you are installing patch set 7.3.3.2.)

Installing a Patch Set

As with any maintenance operation, Oracle Corporation recommends that you back up your Oracle software before making any changes to it.

1. Log in to the *oracle* account and make sure the environment is set to the correct ORACLE_HOME and ORACLE_SID.
2. Uncompress and untar the downloaded patch set file.
3. Shut down the existing Oracle Server instance with normal priority.
4. Start the Installer that was provided in the baseline release. If it is installed on your system, it is under the `$ORACLE_HOME/orainst` directory. Otherwise, you can run it from the baseline release CD-ROM.
5. At the Installation Options screen, specify the Add/Upgrade Software option.
6. Accept relinking when prompted by the Installer.
7. At the Software Asset Manager screen, use the [From] button to bring up a file browser and navigate to the directory with the untarred patch set.
8. Select the Oracle Server (RDBMS), then select the Install button.
9. When the Installer has finished, it prompts you to run the `root.sh` script. You do *not* have to run the `root.sh` script after installing a patch set.

> **Note:** If you are using Oracle Parallel Server, you must install the patch set on all nodes of the cluster.

De-Installing a Patch Set

There is no mechanism provided for de-installing a patch set. If you are concerned about being able to de-install a patch set, Oracle Corporation recommends that you back up your software installation, before applying the patch set.

If you must remove a patch set, Oracle Corporation recommends one of the following procedures (in order of preference):

- restore your `ORACLE_HOME` directory from backup
- re-install the baseline release and any patch sets previously applied, up to but not including the patch set you want to remove

Regardless of how you remove a patch set, please contact Oracle Support Services to verify the problem you are encountering is addressed in the next patch set.

Other Installer Functions

Rebuilding the Client Shared Library and Relinking

Effective with release 8.0.3, most Oracle products use shared libraries. Shared libraries reduce the space required for products; they also significantly reduce the number of circumstances that require relinking. Instead of relinking, some situations require you to rebuild the client shared library, `libclntsh.so`.

Rebuilding the Client Shared Library

Rebuilding the client shared library is required in the following situations:

- after installing or de-installing a protocol adapter other than TCP/IP
- if you want to link Oracle products to use encryption (for example, after installing the Advanced Networking Option, you must relink the Server and client applications with it)

The Installer relinks products and rebuilds the client shared library as necessary.

Relinking Products

The following situations still require relinking:

- after applying a software patch
- if you change the name of the OSDBA or OSOPER groups from the default (dba)

Use the following procedure to relink products:

1. Start the Installer.
2. From the Installation Activity Choice screen, select the Perform Administrative Tasks option.
3. Select the Relink Product Executables option.
4. When the Software Asset Manager screen appears, select all the products to be relinked and select the Install button.
5. If you are relinking on an Oracle Parallel Server system, you must relink the products on all nodes.

Removing Products

When you de-install a product, the Installer removes only the files for the product. It does not remove database objects, directories, or libraries shared by other products. If a library is required only by a product you are removing, the Installer removes the library.

Building a Staging Area

A staging area is a local copy of your Oracle distribution from which you can perform one or more installations. When you create a staging area, you can install and load software in distinct phases. When you install directly from the CD-ROM, you load and install the Oracle distribution in one session.

You should install directly from the CD-ROM if you are performing only one installation, or if you have insufficient disk space to support a staging area in addition to an installed Oracle8 system. Creating and installing from a permanent staging area requires approximately twice the disk space of installing from the CD-ROM.

After you have created a staging area, you cannot add new files to it. For example, you cannot add the files for a software patch to an existing staging area, then install from the area.

Troubleshooting

Installation problems typically fall into one of the following categories:

- Display Problems
- Insufficient Disk Space
- Relinking Error Messages
- Staging Area Problems
- User Errors

Display Problems

If you run the Installer in character mode from an OpenWindows `shelltool` or `cmdtool`, the screen might be difficult to read.

To fix the display for a `shelltool`:

```
$ shelltool -B Offset_x
```

To fix the display for a `cmdtool`:

```
$ cmdtool -B Offset_x
```

To permanently fix the display problem, add the following entry to the `.Xdefaults` file:

```
term.boldStyle: Offset_X
```

Screen Refresh

To refresh the Installer screen during an Installer session, enter:

```
[Ctrl]+[r]
```

Insufficient Disk Space

If the session terminates because the Installer runs out of space during installation, check the `ORACLE_HOME` directory for any files installed prior to the crash. Remove the files for products you were installing.

After you have cleaned up `ORACLE_HOME`, you can use the `df` command to determine how much space is available. Options for resolving the problem include freeing up existing disk space, adding disk space, or installing a subset of the products you had planned to install.

Space in ORACLE_HOME

When the Installer calculates space for transferring files into ORACLE_HOME, it accounts for product dependencies. If it detects there is insufficient space, the Installer issues a warning.

Files are uncompressed as they are copied from the CD-ROM to ORACLE_HOME.

Symbolic Links

If you have created symbolic links in ORACLE_HOME to accommodate parts of the Oracle distribution, the Installer does not follow these links when it calculates space requirements.

If you are sure symbolic links are set up correctly and there is enough space in ORACLE_HOME to install the distribution, you can ignore the Installer warnings regarding insufficient space. Make sure the *oracle* account has read and write permissions on the linked directories.

Swap Space

The swap space available should be two to four times the physical RAM. If the UNIX system uses swap space for relinking, you probably need to increase the size of the swap space. If you run out of swap space during the relinking of product executables, the Installer returns an error message and aborts the session. You do not need to re-install in this case, but you must enlarge the swap space and relink.

Relinking Error Messages

The following error messages can occur during relinking:

Message:	sh: make: Not found
Cause:	Operating system program (make) not available: install it or put it in PATH.
Message:	sh: sh (echodo): cc: Not found
Cause:	Operating system program (cc) not available: install it or put it in your search path.
Message:	ld: fatal error: library not found: *library_name*
Cause:	Operating system library not loaded: *library_name* indicates the name of the library you must install.

Undefined Symbols

Many relinking errors are caused by undefined symbols. Symbols may be undefined when Oracle Net8 protocol adapters are installed without the correct underlying network protocol.

For instance, `putmesg` and `getmesg` undefined symbols occur if you install the Oracle SPX/IPX Protocol Adapter, but do not have SPX/IPX installed.

Most of these errors can be corrected by de-installing and re-installing the Oracle system, without the protocol adapter for which you do not have the network software.

Staging Area Problems

The following issues can arise when installing from a staging area.

Adding Files

Do not attempt to add files to an existing staging area. If you want to add a product to an existing staging area, or if it is necessary to recreate a staging area, you must delete all existing files before using the Installer to create the new one.

User Errors

Following is a list of common pitfalls and indications:

"Cannot Create File"

If the Installer returns a message that it is unable to create a file, you are probably trying to install to a location where the *oracle* account does not have write permission. Use a shell window to change the permissions of the desired directory and retry the operation, or restart the Installer session and specify a different location where the *oracle* account has write permission.

"Cannot Find File"

If the Installer is unable to find a file, check to make sure that you specified the correct location for the CD-ROM, staging area, or link directory from which you are installing. In particular, make sure you did not specify the `ORACLE_HOME` directory (that is, your destination directory) as the installation source directory.

If the installation source is correctly specified and you are installing from a link directory or staging area, try recreating the installation source.

"Connection Not Allowed..."
Messages like the following can occur in a networked environment, when you are logging into a remote machine to run the Installer:

```
Xlib: connection to "unixdoc8:0.0" refused by server
Xlib: Client is not authorized to connect to Server
```

In a terminal window logged into your local machine, authorize the connection:

```
$ xhost + machine_with_Installer
```

Try restarting the Installer on the remote machine. If authorization problems persist, another possible workaround is to run the Installer in character mode, rather than Motif.

"Database Creation Failed"
If the Installer returns a message that it is unable to create the database, make sure there is not an Oracle instance running with a *sid* matching the *sid* (instance name) you specified during the Installation:

```
ps -ef | grep _sid
```

Check the `$ORACLE_HOME/orainst/sql.log` file for other possible problems.

"libXm.so..."
A message like the following indicates the LD_LIBRARY_PATH environment variable is not set correctly:

```
ld.so.1: ./orainst.motif: fatal: libXm.so.3: can't open file: errno=2
Killed
```

Set LD_LIBRARY_PATH to include `$ORACLE_HOME/lib` and the directory containing Motif libraries and retry the Installer.

Display Problems
If you have problems with the display, navigation buttons, or commands, check that the ORACLE_TERM environment variable is set correctly. A full table of ORACLE_TERM settings is available in Chapter 2, "Setting the Environment".

"Not Owner..."
Verify that `$USER` is the same as the userID of the current user (the *oracle* account). The following two commands should return the same user:

```
$ echo $USER
$ id
```

B

Basic UNIX for Installing Oracle8

This appendix covers basic UNIX concepts for installing Oracle8. For more information, refer to your platform specific operating system manuals.

- Essential UNIX Concepts
- Overview of Basic UNIX Commands
- Basic UNIX Commands for Installing Oracle8
- Basic UNIX Syntax and Descriptions

Essential UNIX Concepts

Case Sensitivity

UNIX is case-sensitive and most UNIX commands are in lower case. This means, for example, `Email.Log` and `email.log` are two different files in UNIX. Therefore, you need to be careful when you name and retrieve files and directories.

Executable Scripts

To run any executable script, enter:

```
./script_name
```

For example, to run the `root.sh` script, the command is:

```
./root.sh
```

Wildcard Characters

UNIX provides several special characters, called wildcards, to make it easier to specify multiple filenames and filetypes. The '`*`' wildcard character is especially useful as it stands for any number of any characters. For example, to list all files that have a `.ora` file extension, enter:

```
$ ls *.ora
```

which might display, for example, `init.ora`, `oapref.ora` and `tnsnames.ora`.

```
$ rm *
```

deletes all files from your current directory.

Symbols

Slash

The '/' slash character in UNIX has two meanings. A '/' slash by itself, or at the beginning of a pathname, means the `root` directory. Slashes are also used to separate directory names and file names in long pathnames.

Dollar Sign

The '$' dollar sign has two uses in UNIX.

The dollar sign is used with environment variables to indicate 'the value of' the variable. For instance, if your ORACLE_SID is set to `'test'` and you enter `echo $ORACLE_SID`, the operating system returns the value (`'test'`).

For example:

```
$ echo $ORACLE_SID
test
```

If you enter `echo ORACLE_SID`, without the dollar sign, the operating system returns `ORACLE_SID`.

For example:

```
$ echo ORACLE_SID
ORACLE_SID
```

The dollar sign is also used as the operating system prompt for the Bourne and Korn shells, as in the preceding examples.

Overview of Basic UNIX Commands

Basic UNIX Commands for Chapter 1, "Requirements and Features"

Operating System Patches and Packages

To find out which packages and patches are installed, enter:

For packages:

```
$ pkginfo -i [package_name]
```

For patches:

```
$ showrev -p
```

Basic UNIX Commands for Chapter 2, "Setting the Environment"

Server Manager

Server Manager is used to execute Standard Query Language (SQL) commands.

To start the Server Manager in line mode, enter:

```
$ srvmgrl
```

Logging in as the Root User

Root user privileges allow you to perform system functions denied to other users, such as creating user names or changing permissions on files belonging to other users. The `root` user is also called the superuser account.

Because `root` access gives special (and potentially dangerous) privileges, it is often restricted to system administrators. Contact your system administrator for `root` access.

dba and oper groups

To restrict database administration functions to certain users, you should use the operating system administration utility (`sysadm` or `groupadd`) to create `dba` and `oper` groups in the `/etc/group` file. Because these groups assign Oracle DBA and OPER privileges based on operating system groups, Oracle documentation refers to these groups as OSDBA and OSOPER.

groupadd

Here is an example of how to use the `groupadd` command to create a `dba` group, with a group ID (GID) of 101:

```
$ groupadd -g 101 dba
```

umask

The `umask` command sets the default access permissions on created files. Use the value 022 to give read (and directory search), but not write permission, to members of your group and to other users.

To set the `umask` value to 022, enter the following in the `.profile` or `.login` file of the *oracle* account.

For the Bourne or Korn shells, add the following to `.profile`:

```
umask 022
```

For the C shell, add the following to `.login`:

```
umask 022
```

Environment Variables

Every UNIX shell has what are known as shell, or environment variables, which are values defined for your current session. These variables establish facilities you need; for example, the printer you use, your file permission settings, and the colors displayed on your monitor.

Environment variables for the Oracle Server are usually set in the `.profile` or `.login` file of the *oracle* account. The appropriate file is read automatically when you log in.

To set an environment variable in the Bourne shell, use the following syntax:

variable_name=*value*; export *variable_name*

For example:

```
ORACLE_HOME=/u01/app/oracle/product/806; export ORACLE_HOME
ORACLE_SID=test; export ORACLE_SID
LD_LIBRARY_PATH=$ORACLE_HOME/lib:$LD_LIBRARY_PATH; export LD_LIBRARY_PATH
```

To set an environment variable in the C shell, use the following syntax:

```
setenv variable_name value
```

For example:

```
setenv ORACLE_HOME /u01/app/oracle/product/806
setenv ORACLE_SID test
setenv LD_LIBRARY_PATH $ORACLE_HOME/lib:$LD_LIBRARY_PATH
```

chmod

The `chmod` command changes read, write and execute (`r` for read, `w` for write, and `x` for execute) permissions of file and directories. Only the owner of a file (or the `root` user) can change its mode. Permissions can be changed for the user (the file's owner), members of your UNIX group, and other users (`u` for user, `g` for group, `o` for other).

For example, to give the user, group members and others (world), read, write, and execute permissions to a file, enter:

```
$ chmod ugo+rwx filename
```

Updating the Environment

After you change the values of environment variables in `.profile` or `.login`, make sure they take effect for the current session by executing the `.profile` or `.login` file.

For the Bourne or Korn Shell:

```
$ . .profile
```

For the C shell:

```
% source .cshrc
```

Testing Network Protocols

SPX/IPX Before you install the Oracle SPX/IPX Protocol Adapter, run the vendor-provided test to verify the network is functioning properly:

```
$ /opt/SunWipx/diag/bin/ipxtest
```

To verify that SPX devices have the correct permissions prior to installation, log in as `root` user, then use the `chmod` command:

```
# chmod +rw /dev/mspx
```

This gives all users read and write permissions.

To verify that the transport protocol stack of PC Protocol Services 1.x is running, log in as root, then type:

```
# /opt/SUNWipx/bin/ipxd status
```

Installing Oracle Parallel Server Option

Oracle Parallel Server instances use the Distributed Lock Manager (DLM) to communicate with each other and to coordinate modifications of blocks.

To make sure DLM is running, enter:

```
$ ps -ef | grep dlmd
```

Issuing this command gives you a listing of the DLM processes that are currently running. After you issue this command, verify that the DLM program appears in the process listing.

Verifying UNIX Groups Make sure you have an OSDBA group defined in the `/etc/group` file on all nodes of the cluster, by entering:

```
$ more /etc/group
```

Verify that an identical group exists (named `dba`, for example) on all nodes.

Creating *oracle* Accounts Create an *oracle* account on each node of the cluster. Ensure that:

- the *oracle* account is a member of the OSDBA group
- the account is used only to install and update Oracle software
- the *oracle* account has write permissions on remote directories

Creating Mount Point Directories Create a mount point directory on each node to serve as the top of your Oracle software directory structure. Ensure that:

- the name of the mount point on each node is identical to that on the initial node
- the *oracle* account has read, write, and execute privileges on the mount point directories

For example, the output of an `ls -l` command should be identical for all nodes, and might look like:

```
drwxr-xr-x   1   oracle    dba      98 May 21 12:13 u01
```

User Equivalence Set up user equivalence, so the *oracle* account has seamless access to all nodes, by adding entries for the other nodes in the cluster to the `.rhosts` file of the *oracle* account, or the `/etc/hosts.equiv` file.

Basic UNIX Commands for Chapter 3, "Installation Tasks"

Start the Installer

Start the Installer by entering one of the following commands:

`./orainst /m` for Motif mode

`./orainst /c` for character mode.

Basic UNIX Commands for Chapter 4, "Configuring the Oracle8 System"

Run the root.sh Script

To run the `root.sh` script, enter the following:

```
# cd $ORACLE_HOME/orainst
# ./root.sh
```

Basic UNIX Commands for Installing Oracle8

Table B–1 Basic UNIX Commands

User Commands	Description
`cat`	concatenate and display
`cd`	change working directory
`chgrp`	change the group ownership of a file
`chmod`	change the permissions mode of a file
`chown`	change owner
`cp`	copy files
`echo`	echo arguments to the standard options
`env`	obtain or alter environment variables for command execution
`find`	find files by name, or by other characteristics
`grep`	search a file for a string or regular expression
`groupadd`	create a user group
`kill`	send a signal to a process, or terminate a process
`ls`	list the contents of a directory
`man`	display UNIX reference manual pages; find reference pages by keyword
`mkdir`	make a directory
`more`	browse or page through a text file
`mv`	move or rename files
`page`	browse or page through a text file
`passwd`	change local or Network Information System (NIS) password information
`ps`	display the status of current processes
`pwd`	display the pathname of the current working directory
`rlogin`	start a login to a different machine
`rm`	remove (unlink) files or directories
`rmdir`	remove (unlink) directories

Table B–1 Basic UNIX Commands

User Commands	Description
`set`	set the values of all shell variables
`setenv`	set environment variables
`umask`	show the permissions that are given to view files by default
`uname`	display name of the current system

Basic UNIX Syntax and Descriptions

cat *filename*

Displays contents of *filename* to screen. Use the `cat` command to concatenate and display files containing text that UNIX can display on your screen.

Examples:

Use `cat` *filename* to display contents of *filename* to the screen.

Use `cat` *`filename1 > filename2`* to overwrite contents of *`filename2`* with *`filename1`*.

Use `cat` *`filename1>> filename2`* to append contents of *`filename1`* to *`filename2.`*

cd

Changes the current working directory.

Examples:

To change to your own home directory, enter:

```
cd
```

To change to the previous higher directory, enter:

```
cd ..
```

To change to the specified directory, enter:

```
cd /usr
```

chgrp *group_name filename*

Changes the group that has access to a file or directory.

Example:

Use `chgrp dba tools.dbf` to make the `dba` group the owner of the file `tools.dbf`.

chmod *code_name* + *code_name filename*

Changes read, write, execute permissions on *filename* for user / owner, group and others.

Examples:

Use the `chmod ugo+rwx` *`filename`* syntax to give user (file owner), group members and others, read, write and execute permissions to a file.

Use the `chmod go-r` *`filename`* syntax to prevent group members and others from reading the file.

chown *username filename*

Changes the owner of *filename* to the given user (Oracle).

Example:

chown *user/temp/foo*

cp *filename1 filename2*

Copy *filename1* to *filename2*. This creates *`filename2`*, if it does not already exist.

Example:

cp *filename1 filename2*

cp -i * *directory_name*

Copies all files in current directory to the given *directory_name*. If '`-i`' is used you are prompted to verify whether or not any files of the same name should really be overwritten in the target directory.

echo $*variable_name*

Displays the value you have set for a given variable. For example, to see what your current search path is, enter:

For the Bourne or Korn shell:

```
$ echo $LD_LIBRARY_PATH
```

find . -name '*string**' -print

Searches the current directory and all subdirectories for any files starting with the value *`string`*. If found, the full file names are printed to the screen.

grep *string filename*

Searches the specified file for a particular *string*.

Example:

To find out if `jwilson` is a valid username listed in the password file, enter:

```
grep jwilson /etc/passwd
```

kill *process_number*

Terminates a selected process, identified by the *process_number*. First use the `ps` command to list the numbers of running processes.

Example:

```
kill 1351
```

If the normal `kill` command does not work, use:

```
kill  -9 process_number
```

but be sure you have the correct process, as this is a forced termination.

ls

Displays the names of the files in the current directory. When `ls` is used with the `-a` option, 'dot' files, `.login` for example, are listed. When `ls` is used with the `-l` option, a long list consisting of userID, file size, date the file was created, and the name of the file is shown.

ls -al *directory*

Displays the files in the specified directory.

man *command_name*

Displays online manual pages for *command_name*.

Use the `man who` syntax to find out how to use the UNIX *who* command.

mkdir *directory*

Creates a new directory under the current directory.

Example:

```
mkdir letters
```

mv *filename directory*

Use this command to move a file from one location to another, or to rename a file and erase the original file.

Example:

Use `mv` *filename* `/usr/opt/` to delete *filename* from the current directory and make a new *filename* in the `/usr/opt/` directory.

passwd

Allows you to change your login password.

ps

Lists the current processes that are executing.

pwd

Displays the current directory in which you are working.

rlogin *host_name*

Allows you to connect and work on a different machine on your network.

Example:

```
rlogin hostb
```

rm *filename*

Deletes *filename* from the disk without verifying whether or not this is something you really want to do.

Example:

```
rm filename
```

rm -i *filename*

Deletes *filename* after verifying that you want to erase the file.

Example:

```
rm -i oldletter
```

rmdir *directory*

Deletes a directory only if it is empty.

Example:

```
rmdir directory
rmdir: Directory not empty
```

rm -rf *directory*

Deletes a directory and all the files it contains, and any subdirectories without asking for verification.

Example:

```
rm -rf directory
```

su

Switches you to `root` user after a password prompt.

C

National Language Support

This appendix lists supported sort sequences, character sets, and languages and territories for Oracle. This appendix is not a detailed discussion of Oracle National Language Support (NLS).

- Supported Sort Sequences
- Supported Character Sets
- Supported Languages and Territories

Supported Sort Sequences

Available linguistic sort sequences are:

Arabic	German_Din	Italian	Spanish
Czech	XGerman	Latin	XSpanish
Danish	XGerman_Din	Norwegian	Swedish
XDanish	Greek	Polish	Swiss
Dutch	Hebrew	Russian	Turkish
Finnish	Hungarian	Slovak	Turkish
German	Icelandic	XSlovak	West_European

Supported Character Sets

Oracle NLS supports the following character sets:

7-Bit Character Sets

US7ASCII	US 7-bit ASCII(default)
D7DEC	DEC German 7-bit
F7DEC	DEC French 7-bit
S7DEC	DEC Swedish 7-bit
E7DEC	DEC Spanish 7-bit
AR7ASMO449PLUS	Arabic / Latin ASMO-Plus 7-bit
TR7DEC	DEC Turkish 7-bit
SF7ASCII	Finnish 7-bit ASCII extension
NDK7DEC	DEC Norwegian / Danish 7-bit
I7DEC	DEC Italian 7-bit
NL7DEC	DEC Dutch 7-bit
CH7DEC	DEC Swiss 7-bit
SF7DEC	DEC Finnish 7-bit

8-bit Character Sets

US8ICL	ICL EBCDIC 8-bit US
WE8ICL	ICL EBCDIC 8-bit West European
EE8PC853	IBM PC 8-bit East European - code page 852
LT8PC772	IBM PC 8-bit Lithuanian - code page 772
LT8PC774	IBM PC 8-bit Lithuanian - code page 774
DK8EBCDIC277	EBCDIC 8-bit Danish - code page 277
WE8DEC	DEC West European 8-bit
WE8HP	HP 8-bit West European
US8PC437	IBM PC 8-bit U. S. - code page 437

WE8EBCDIC37	EBCDIC 8-bit West European - code page 37
WE8EBCDIC500	EBCDIC 8-bit West European - code page 500
EL8EBCDIC875	EBCDIC 8-bit Greek - code page 875
WE8PC850	IBM PC 8-bit West European - code page 850 (for use with HFT terminals)
WE8ISO8859P1	ISO 8859-1 West European 8-bit
EE8ISO8859P2	ISO 8859-2 East European 8-bit
SE8ISO8859P3	ISO 8859-3 South European 8-bit
CL8ISO8859P5	ISO 8859-5 Cyrillic 8-bit
CL8MSWIN1251	Windows Cyrillic 8-bit (Replaces CL8MSWINDOW31)
CLMACCYRILLIC	Mac Cyrillic 8-bit
EL8ISO8859P7	ISO 8859-7 Latin / Greek 8-bit
IW8ISO8859P8	ISO 8859-8 Latin / Hebrew (Iwriet) 8-bit
WE8ISO8859P9	ISO 8859-9 West European / Turkish 8-bit
EL8DEC	DEC Latin / Greek 8-bit
TR8DEC	DEC Turkish 8-bit
EL8PC437S	IBM-PC Special American / Greek character set
EEC8EUROPA3	EEC's EUROPA3 West European / Greek 8-bit character set
RU8BESTA	Latin / Cyrillic BESTA 8-bit
RU8PC866	IBM-PC Latin / Cyrillic 8-bit - code page 866
RU8PC855	IBM-PC Latin / Cyrillic 8-bit - code page 855
D8EBCDIC273	EBCDIC 8-bit Austrian / German - code page 273 / 1
I8EBCDIC280	EBCDIC 8-bit Italian - code page 280 / 1
N8PC865	IBM PC 8-bit Norwegian - code page 865
TH8TISASCII	Thai Industrial Standard 620-2533 ASCII 8-bit
TH8TISEBCDIC	Thai Industrial Standard 620-2533 EBCDIC 8-bit

TR8PC857	IBM-PC Turkish 8-bit - code page 857
NEE8ISO8859P4	ISO 8859-4 North and North-east European
AR8ISO8859P6	ISO 8859-6 Latin / Arabic
AR8ASMO708PLUS	Arabic / Latin ASMO-Plus 8-bit (not valid as a storage character set)
TR8ISO8859P9	Turkish version ISO 8859-9 West European

Multi-Byte Character Sets

JA16VMS	Japanese VMS Kanji
JA16EUC	Japanese Extended UNIX Code
JA16EBCDIC930	Japanese
JA16SJIS	Japanese Shift-JIS
JA16DBCS	Japanese IBM
KO16KSC5601	Korean KSC5601
KO16DBCS	Korean IBM
ZHS16CGB231280	Chinese GB2312-80
ZHS16GBK	Chinese GBK
ZHT32CNS11643-86	Taiwan Traditional Chinese
ZHT16BIG5	BIG5 Traditional Chinese
ZHT32EUC	Traditional Chinese Extended UNIX Code

Supported Languages and Territories

Table C–1 lists language and territory names, and the corresponding NLS values. The table also lists the recommended character set for each language / territory pair.

Table C–1 Languages, Territories, and Recommended Character Sets

Language Name	NLS Value	Territory Name	NLS Value	Recommended Character Set
American	american	United States	america	US7ASCII
Arabic	arabic	United Arab Emirates	“united arab emirates”	AR8ISO8859P6
Brazilian Portuguese	“brazilian portuguese”	Brazil	brazil	WE8DEC
Canadian French	frc	Canada (Quebec)	frc	WE8DEC
Czech	czech	Czech Republic	czechoslovakia	EE8ISO8859P2
Danish	danish	Denmark	denmark	WE8DEC
Dutch	dutch	The Netherlands	“the netherlands”	WE8DEC
Finnish	finnish	Finland	finland	WE8DEC
French	french	France	france	WE8DEC
German	german	Germany	germany	WE8DEC
Greek	greek	Greece	greece	EL8DEC
Hungarian	hungarian	Hungary	hungary	WE8ISO8859P2
Icelandic	is	Iceland	is	WE8ISO8859P1
Italian	italian	Italy	italy	WE8DEC
Japanese	japanese	Japan	japan	JA16EUC
Korean	korean	Korea	korea	KO16KSC5601
Lithuanian	lt	Lithuania	lt	NEE8ISO8859P4
Mexican Spanish	esm	Mexico	esm	WE8DEC
Norwegian	norwegian	Norway	norway	WE8DEC
Polish	polish	Poland	poland	EE8ISO8859P2
Portuguese	portuguese	Portugal	portugal	WE8DEC

Table C–1 Languages, Territories, and Recommended Character Sets (Cont.)

Language Name	NLS Value	Territory Name	NLS Value	Recommended Character Set
Russian	russian	CIS	cis	CL8ISO8859P2
Simplified Chinese	"simplified chinese"	China	china	ZHS16CGB231280
Slovak	slovak	Slovakia	slovakia	EE8ISO8859P2
Spanish	spanish	Spain	spain	WE8DEC
Swedish	swedish	Sweden	sweden	WE8DEC
Thai	th	Thailand	th	TH8TISASCII
Traditional Chinese	"traditional chinese"	Taiwan	taiwan	ZHT32EUC
Turkish	turkish	Turkey	turkey	WE8ISO8859P9

Index

Numerics

A

B

C

D

E

F

G

H

I

J

K

L

M

N

O

P

R

S

T

U

V

W